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A Q U A P H Y T E

A NEWSLETTER ABOUT AQUATIC, WETLAND AND INVASIVE PLANTS

Center for Aquatic and Invasive Plants

with support from

The Florida Department of Environmental Protection,
Bureau of Invasive Plant Management
The U.S. Army Corps of Engineers,
Waterways Experiment Station,
Aquatic Plant Control Research Program
The St. Johns River Water Management District



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APIRS Database Update -

<http://plants.ifas.ufl.edu/search80/NetAns2/>

After 22 years of assiduous work, the APIRS database contains more than 60,000 annotated citations for scientific articles and reports about uncounted species of aquatic, wetland and invasive plants. Beginning as a mainframe, punch-card database with a few hundred references about water hyacinths, the APIRS database has grown to be the largest free database of its kind in the world. After a recent period in which the database was unavailable due to computer crashes, it is now up and running and better than ever. It has retained the quick searching speed which is now combined with an easy-to-use web interface. The database has been used many thousands of times by researchers, government agencies, companies, teachers, students and private groups and individuals.

The History of APIRS

APIRS originally was meant to be a source of information for "aquatic weed" workers in developing countries, and was funded by the U.S. Agency for International Development (USAID) for that purpose. It quickly became a source of information for workers in Florida as well, gaining the support of the then Bureau of Aquatic Plant Management of the Florida Department of Natural Resources (now the Bureau of Invasive Plant Management of the Florida Department of Environmental Protection (DEP)). USAID ceased sponsorship of the database in the early 1980s. The DEP Bureau continues to be a primary sponsor of the APIRS program. The U.S. Army Corps of Engineers Aquatic Plant Control Research Program supports national and international APIRS services. The program also is supported by the St. Johns River Water Management District, with occasional special-project support coming from other agencies and companies such as the U.S. Environmental Protection Agency and Cerexagri.

APIRS was developed by Mr. Victor Ramey, who continues to manage the overall program. Ms. Karen Brown now manages the database itself, while Ramey works to develop other informational and educational products about aquatic, wetland and invasive plants. Ms. Mary Langeland is the cataloger of all materials placed in the database.

The Value of APIRS - (It's FREE!)

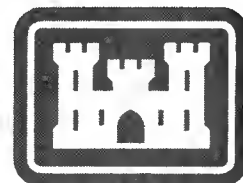
Essentially, APIRS is a bibliographic database devoted to the research of aquatic, wetland and invasive plants. Databases abound, but none of them are entirely devoted to these specific plants, and few, if any, are free. A researcher or an institution can subscribe to journals, but these are very expensive, ranging in price from a few hundred to a few thousand dollars each per year. In addition, journals are focused on a specific subject, and this is clear by the journal titles: *Aquatic Botany*, *Plant Physiology*, *Journal of Ecology*, etc. But subjects in aquatic and invasive plant research often cross disciplinary boundaries. Invasive and aquatic plant

APIRS Supporters

In addition to basic support from the University of Florida, Institute of Food and Agricultural Sciences, the APIRS office of the Center for Aquatic and Invasive Plants is especially appreciative of the generous support of the Aquatic Plant Control Research Program of the Army Corps of Engineers, Mr. John W. Barko, Program Manager, (<http://www.wes.army.mil>).

In addition, significant support has been received from the Florida Department of Environmental Protection, Bureau of Invasive Plant Management, Ms. Kathy Burks, (<http://www.dep.state.fl.us/lands/invaspec/index.htm>). The DEP Bureau was the original sponsor of the database, and also currently supports web site development, public education and manager education projects (Mr. Jeff Schardt).

Other necessary and much appreciated support has come from the St. Johns River Water Management District and the U.S. Army Corps of Engineers - Jacksonville District.



Continued on Pages 2-3

APIRS Online Search Screen

Logout

Please logout when you are done to release system resources to others.

To combine or refine a search, use this Search history button. (Ex: S1 and hydrilla\$)

For search hints, click here:

Hopefully Helpful Hints

Please enter search criteria into one or more of the fields below. Use \$ for "wildcard" searches. (Ex: aquat\$)

Words Anywhere (in titles, pubs info, categories, keywords...) Use single words or Boolean commands

Date			
Words in Titles	hydrilla\$		
Author Names (Must Use \$ Ex: Smith\$)		AND	
Publication			AND
Subject Categories		AND	
Keywords			AND
Plants By scientific names		AND	

Please select sort criteria:

Sort by.. in order..

Ascending

To submit the query, click here:

Submit Query

To enter new query, click here:

Clear Screen

Logout

Please logout when you are done to release system resources to others.

1 - Search for Hydrilla (in title)

2 - List of Results

APIRS Online

Aquatic, Wetland and Invasive Plants Database

Your search terms:

hydrilla\$.titl.

1189 Record(s) found (This page: 1 ~ 16)

Logout

Please logout when you are done to release system resources allocated for you.

	Date	Author	Title
1	2003	PURI,A. ** MACDONALD,G.E. ** HALLER,W.T.	INVESTIGATIONS INTO FLURIDONE TOLERANCE IN SELECTED HYDRILLA [HYDRILLA VERTICILLATA(L.F.) ROYLE] POPULATIONS
2	2002	GATEWOOD,R.	HYDRILLA IN LONG POND, MASSACHUSETTS - AN UPDATE
3	2002	HALLER,W.	HYDRILLA IN GUATEMALA
4	2000	O'CONNELL,R.A.	CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE'S HYDRILLA ERADICATION PROGRAM
5	2000	COCKREHAM,S.D. ** NETHERLAND,M.D.	SONAR USE IN CALIFORNIA TO MANAGE EXOTIC PLANTS: HYDRILLA , EURASIAN WATERMILFOIL, AND EGERIA
6	2002	FOX,A.M. ** HALLER,W.T. ** CUD,A,J.P.	IMPACTS OF CARBOHYDRATE DEPLETION BY REPEATED CLIPPING ON THE PRODUCTION OF SUBTERRANEAN TURIONS BY DIOECIOUS HYDRILLA
7	2002	RYBICKI,N.B. ** CARTER,V.	LIGHT AND TEMPERATURE EFFECTS ON THE GROWTH OF WILD CELERY AND HYDRILLA
8	2002	MACDONALD,G.E. ** QUERNS,R. ** SHILLING,D.G. ** MCDONALD,S.K. ** ET AL	ACTIVITY OF ENDOTHALL ON HYDRILLA
9	2002	LANGELAND,K.A. ** HILL,O.N. ** KOSCHNICK,T.J. ** HALLER,W.T.	EVALUATION OF A NEW FORMULATION OF REWARD LANDSCAPE AND AQUATIC HERBICIDE FOR CONTROL OF DUCKWEED, WATERHYACINTH, WATERLETTUCE, AND HYDRILLA
10	1989	HESTAND,R.S. ** THOMPSON,B.Z. ** CLAPP,D.	EXPERIMENTAL HYDRILLA CONTROL UTILIZING A LOW STOCKING RATE OF TRIPLOID GRASS CARP IN A LARGE NATURAL SYSTEM
11	1976	VICTOR,D.M.	EFFECT OF MODEL AND NATURAL CHELATING AGENTS ON THE GROWTH OF HYDRILLA
12	1979	SHIREMAN,J.V. ** MACEINA,M.J.	TECHNIQUES UTILIZING A RECORDING FATHOMETER IN DETERMINING DISTRIBUTION AND BIOMASS OF HYDRILLA VERTICILLATA ROYLE
13	2002	LEAVITT,J.R. ** O'CONNELL,R. ** ZARATE,F.	LAKE/CHOWCHILL RIVER COMPLEX IN CALIFORNIA: 2002 UPDATE
14	2002	NETHERLAND,M.D. ** DAYAN,F. ** SCHEFFLER,B. ** COCKREHAM,S.	THREE AND A HALF-YEARS OF LABORATORY AND FIELD MONITORING OF FLURIDONE-TOLERANT HYDRILLA : WHAT HAVE WE LEARNED?
15	2002	MACEINA,M.J. ** SLIPKE,J.W.	THE USE OF HERBICIDES TO REPLACE HYDRILLA WITH NATIVE SUBMERSED PLANTS AND IMPACT ON JUVENILE LARGEMOUTH BASS IN LAKE SEMINOLE
16	1982	HABECK,D.H.	PANAMANIAN PARAPOYNX SPP. FOR BIOLOGICAL CONTROL OF HYDRILLA

Sort by.. in order

Ascending

Re-Sort the List Above

3 - Display of Record

APIRS Online

Aquatic, Wetland and Invasive Plants Database

Please logout when you are done to release system resources to others.

Record 7 out of 1191

Title

IMPACTS OF CARBOHYDRATE DEPLETION BY REPEATED CLIPPING ON THE PRODUCTION OF SUBTERRANEAN TURIONS BY DIOECIOUS **HYDRILLA**

Author(s)

FOX,A.M. ** HALLER,W.T. ** CUD,A,J.P.

Date

2002

Citation

J. AQUATIC PLANT MANAGE. 40:99-104

Categories

DISTRIBUTION ** FLORIDA ** ECOLOGY ** ECOSYSTEM ** PRIMARY PRODUCTION ** MECHANICAL CONTROL ** CUTTING

Keywords

EFFECTS ** RESOURCE ALLOCATION ** CARBOHYDRATES ** BIOMASS ** TUBERS ** LEAF LOSS ** SHOOT LOSS

Plants

HYDRILLA VERTICILLATA

Update

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Documment Number

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Continued from Page 1

information can be published in ecology journals, weed science journals, or journals covering crop science, natural areas, wildlife management, ecological restoration, biogeography, and more. In the book, *Life Out of Bounds - Bioinvasion in a Borderless World*, Chris Bright comments that "Information on exotics is badly fragmented - it is scattered about in hundreds of technical newsletters and publications. . . ." Peter Pysek, in a chapter titled "Recent trends in studies on plant invasions" from *Plant Invasions - General Aspects and Special Problems*, states that "the available information on plant invasions is scattered . . . in at least 189 journals," and that journal literature comprises 80% of the total published information. Pysek names the top 13 journals and goes on to explain that in his sample, which covered the literature on any aspect of the ecology of non-native species, nine journals covered 28% of the published studies, and 20 journals covered almost 50% of the published studies. That is a lot of expensive journals to subscribe to. Pysek went on to say that approximately 15% of the literature on invasive plants was published in books or proceedings, and 4% was published in internal reports or theses. These types of items have been cataloged and entered into the **APIRS** database since its inception.

Many of the scientific journals are indexed, and sometimes abstracted, in commercial databases such as *Biological Abstracts*, *Cambridge Scientific Abstracts*, *Current Contents* and others. However, unless you subscribe to these databases, or belong to an institution that does, you do not have access to them. These databases often are even more expensive than individual journals.

APIRS collects and catalogs journal articles, books, book chapters, theses, conference proceedings, agency reports and other published scientific literature. To build the **APIRS** collection, we write to authors for reprints, reports and books to be cataloged and entered into the database. Authors usually are happy to contribute their published research to the database, thus making it widely known to others in their field. Many regional research centers around the world also contribute relevant publications. We rely on these contributions to maintain a comprehensive collection. In exchange, researchers have access to a *free bibliographic database* of references specific to their field. To contribute publications to **APIRS**, please send reprints, photocopies or PDF's.

Searching APIRS

To search **APIRS**, go to <http://plants.ifas.ufl.edu> and click on **APIRS Online Database**. From this page, you can select **Helpful Hints and Specific Examples** for better searching of the database; **Some Keywords in the Database** for a simple list of keywords commonly used in the database; **Category and Keyword Use** for a list of definitions of the categories and keywords that we use when cataloging references; or **Search** to search for references in the database. Actually the database is straightforward enough even for first-time users to search without any instructions being necessary. However, to obtain the best results, it is best to consult the help pages. If difficulty or confusion is encountered when using the database, please contact Karen Brown at kpb@mail.ifas.ufl.edu. She will assist you with any problems or help you create a search strategy that will optimize your search results.

Finding Full Text

The **APIRS** database contains fully annotated citations for each reference, but *not full text*. We would like to be able to provide copies of publications to users of the database, but we are not permitted to do so under copyright law.

For those with access to an academic library, many books and journals may be available there. Also, most academic libraries participate in "interlibrary loan" (ILL) agreements, enabling them to borrow items from other libraries for their patrons. ILL requests can cost approximately \$10 per item for non-members of the university and can be free for members, but this will vary between libraries.

Some articles may be downloaded directly from a journal's web site, but many require a fee.

To purchase the full text of cited articles, visit the document delivery services listed below. These services comply with copyright law. They can provide documents for fees ranging from \$15 to \$45 per article, with payment via online transaction or invoicing. These sources are not guaranteed to have references cited in **APIRS**, but they are the most likely document delivery services for science related journal articles. Although most of these sources have databases in their own right, none of them has the comprehensive coverage of the literature on aquatic, wetland and invasive plants found in **APIRS**.

ISI Document Solution - Institute for Scientific Information, <http://www.isinet.com/isi/products/ids/ids/> or 800/523-1850. Scanned articles are provided and various methods of delivery are available, including fax, Federal Express and standard mail delivery.

Ingenta (formerly CARL UnCover) - <http://www.ingenta.com/> or 800/787-7979. Full text articles are available by fax, Ariel (a digitized format used between libraries), or 24 hour electronic display/download. Payment by credit card.

ScienceDirect, <http://www.info.sciencedirect.com/> - a pay-per-view ordering process which allows 24 hour access to full text articles in PDF format, payable by credit card.

CAB International (UK) - <http://www.cabi-publishing.org/Products/Library/Document/Index.asp> Mail or fax delivery available.

British Library Document Supply Centre - <http://www.bl.uk/services/document.html> ". . . a rapid and comprehensive document supply and interlibrary loan service from our extensive collections to researchers and scholars in all kinds of libraries and organisations." Self-described as the leading document provider in the world.

Canada Institute for Scientific and Technical Information (CISTI) - http://cisti-icist.nrc-cnrc.gc.ca/lib_docdel_e.shtml. One of the largest scientific and technical libraries in North America. Copyright-cleared document delivery services provided.

National Library of Australia - <http://www.nla.gov.au/dss/>. Australia's largest document supply center.

DocDel.net - <http://www.docdel.net/index.html>. A directory for document delivery services and users - hundreds of resources and providers.

For items that cannot be found using these document delivery services, contact Karen Brown for assistance at 352.392.1799 or kpb@mail.ifas.ufl.edu

Books/Reports

13TH AUSTRALIAN WEEDS CONFERENCE, Papers and Proceedings, edited by H. Spafford Jacob, J. Dodd and J.H. Moore. 2002. 764 pp.

(Published by the Plant Protection Society of Western Australia. Order from Rob Richardson, POB 42, Meredith, Victoria 3333, Australia. Email: richardson@weedinfo.com.au)

Many papers are contained in sections about weed management and ecology of six Australian ecosystems; modelling; invasions and eradications; herbicide use; herbicide resistance; biological controls; education and training; weed biology and genetics; mapping; economics; and integrated weed management.

This book contains a very interesting essay by Tim Low that pertains worldwide, titled, *Why are there so few weeds?*

WETLANDS AND REMEDIATION II, Proceedings of the Second International Conference on Wetlands and Remediation, Burlington, VT, September 5-6, 2001, edited by K.W. Nehring and S.E. Brauning. 2002. 386 pp.

(Published by Battelle Press, 505 King Ave., Columbus, Ohio 43201; 614-424-6393. WWW: <http://www.battelle.org/bookstore>. ISBN 1-57477-122-1)

This proceedings contains 45 papers organized into four sections: Remediation of Wetlands Contamination; Wetlands for Wastewater Treatment; Wetlands Design, Construction and Operation; and Wetlands Ecology and Restoration. Discussed are the attenuation processes of certain pollutants in wetlands, including chlorinated solvents, chlorobenzenes, trichloroethene, hydrophobic organic compounds, nonionic organics, hydrocarbons, mercury, cesium, selenium and perchlorate. Also presented are designs for systems to treat a variety of wastewaters, from cheese processors to slaughterhouses.

NATURAL WETLANDS FOR WASTEWATER TREATMENT IN COLD CLIMATES, edited by U. Mander and P. Jenssen. 2002. 248 pp.

(Published by WIT Press, c/o Computational Mechanics Inc., 25 Bridge ST, Billerica, MA 01821. 978-667-5841. WWW: <http://www.compmech.com> ISBN1-85312-859-7; \$139.00.)

This book includes 13 papers about the potential and use of "natural wetland ecosystems" for wastewater treatment in cold climate areas. Examples include 1) Minot, North Dakota's successful wastewater treatment facility for 46,000 residents that uses wetland cells planted with *Scirpus validus*, *Lemna*, *Potamogeton pectinatus*, *Vallisneria americana*, *Sagittaria latifolia* and *Typha latifolia*; 2) a nitrogen-removal wetland in Sweden, planted with *Carex* species, *Phragmites*, *Typha* species and *Scirpus lacustris*; 3) peat-mining water treatment in Finland; 4) heavy metal accumulation wetlands in Lithuania; and constructed wetlands in Germany; Estonia, Ukraine, and northern China.

NONNATIVE INVASIVE PLANTS OF SOUTHERN FORESTS - A Field Guide for Identification and Control, by J.H. Miller. 2003. 93 pp.

(Published by USDA Forest Service, Southern Research Station, POB 2680, Asheville, NC 28802. (No ISBN Number) (No ordering info.))

This medium-format book is perhaps the best, and certainly the most professionally produced, of the current crop of the genre, "ID books about invasive plants." Each of the 33 plants included are treated with multiple large format color photographs taken during various seasons of the life of the plant, including foliage, bark, flowers, and fruit. The photographs are excellent in themselves but they also have been properly scanned, Photoshopped and prepared for publication, resulting in very high quality reproduction; the many steps required for acceptable photo-reproduction are something that other government and academic publishers should learn to do.

Information about each plant includes detailed descriptions of all plant parts, the

ecology of the plant, and a list of similar-looking plants that it might be confused with. Also included are range maps for each invasive plant in southern forests. The last 25 pages of the book are a primer on how to control invasive plants in the wild, the various treatment methods carefully described and thoughtfully illustrated. Finally, detailed "prescriptions" for controlling each of the plants are presented.

Like so many government and academic issues, this one does not have an ISBN number or barcode, nor does it have a price or include ordering information.

This and other guides would do well to include this kind of "trade-required" information so that these informative publications may be distributed to and sold by real book stores, thus making the guides available to a much wider audience, including the interested general public, than is possible without the required information.

NATURE MANAGEMENT OF COASTAL SALT MARSHES, Interactions Between Anthropogenic Influences and Natural Dynamics, by P. Esselink. 2000. 253 pp.

(Published by Koeman en Bijkerk bv, Postbus 14, 9750 AA Haren, The Netherlands. ISBN 9036712947. Hardcover: 18 Euro plus S/H. Email: koeman.en.bijkerk@biol.rug.nl)

This published Ph.D. thesis focuses on the more-or-less man-made salt-marshes of the mainland coast of the Wadden Sea. The marshes were originally used for coastal protection, livestock and agriculture, but as they have become less profitable, they have been taken over to be used as nature reserves or parts of national parks. This study identifies management practices that will "conserve and enhance the conservation value of these salt marshes," taking into consideration that they have become major grazing grounds for geese and other herbivorous waterfowl. Special emphasis is placed on the relationships between plant development and succession and sediment accretion and marsh topography. A couple of case studies explore the dependency of the greylag goose, *Anser anser*, on a preferred native food, *Scirpus maritimus* and on the non-native salt marsh plant, *Spartina anglica*.

WEED ECOLOGY IN NATURAL AND AGRICULTURAL SYSTEMS, by B.D. Booth, S.D. Murphy and C.J. Swanton. 2003. 303 pp.

(Published by Oxford University Press, 198 Madison Avenue, New York, NY 10016. 1-800-451-7556. ISBN 0-85199-528-4. \$60.00 + S/H. WWW: <http://www.oup.com>)

Why do weeds occur where they do? is the question answered in this book. (No management or control stuff here.) "Ecology is central to our understanding of how and why weeds invade... This text presents ecological principles as they relate to weeds."

The book was "designed as a teaching text for a middleyear undergraduate course." In fact, it was designed to be a teaching tool as well: For the student: choose a weed of your choice; at the end of each chapter is a list of questions; summarize information about your weed that relates to each chapter; apply the ecological principles you learn; "by the end of the book, you will have created a case history of your chosen weed." For the instructor: the material in the book is to be covered one chapter per week and can be covered in a single-term course.

Subjects include, introduction to weed ecology; population ecology, structure and dynamics, reproduction and life history; interactions between populations, competition, allelopathy, herbivory, parasitism, mutualism; community ecology, diversity, structure, dynamics, succession, assembly, and plant invasions. Enjoy.

INVASIVE EXOTIC SPECIES IN THE SONORAN REGION, edited by B. Tellman. 2002. 460 pp.

(Published by the University of Arizona Press, 355 Euclid, Ste. 103, Tucson, AZ 85719; 520-621-1441. WWW: <http://www.uapress.arizona.edu> ISBN 0-8165-2178-6. Cloth, \$75.00 plus S/H.)

This book is a "synthesis of the information" presented at a 1998 symposium on the invasive species of the Sonoran Region, which includes the Gulf of California and its islands; the low and high deserts and grasslands of Arizona, Sonora and Baja; southeastern California and the lower

Colorado River through the Grand Canyon. Rainfall: from 3 to 15 inches a year. Temperature: from 15 to 120 degrees F. The book includes reviews of the history of human introduction of exotic species in the region, and case histories of various exotic plants and animals there. It concludes with several chapters on exotic species management and an overview of biological control.

One particularly noteworthy chapter is about what it takes to predict which introduced species are likely to become naturalized and invasive. This chapter, by R.N. Mack, is specifically about the Sonoran Region but its insights might well apply to any place where managers are faced with invasive plant management.

Among other things, the editor notes that "the lag time from introduction to naturalization to invasion can be more than one hundred years... African sumac (*Rhus lancea*), once considered a relatively harmless landscape exotic shrub, has recently begun spreading at an alarming rate, most often along washes." Also that *Eucalyptus microtheca*, first introduced in the 1880s, has waited until now to start spreading on its own.

INVASIVE AQUATIC SPECIES OF EUROPE. Distribution, Impacts and Management, edited by E. Leppakoski, S. Gollasch and S. Olenin. 2002. 583 pp.

(Published by Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061. ISBN 1-4020-0837-6. \$139.00 plus S/H.)

This book represents the "first attempt to provide an overall picture of aquatic species invasions in Europe." The species lists, tables and references are searchable at <http://www.ku.lt.nemo/EuroAquaInvaders.htm>

Sections of the book include 1) Who is Who Among Nonindigenous Species, a selection of reviews about aquatic invaders of all types; 2) Vectors, or how exotics get around; 3) Regional Overviews, of various seas, coasts and rivers of Europe; 4) Impacts, ecological in nature; 5) Risk Assessment, methodology; 6) Treatment Measures, of ballast water; and 7) Databases, on aquatic alien species of Europe.

THE WILD ORCHIDS OF NORTH AMERICA, North of Mexico, by P.M. Brown, with illustrations by S. Folsom. 2003. 256 pp.

(Published by the University Press of Florida, 15 NW 15 ST, Gainesville, FL 32611-2079; 1-800-226-3822. WWW: <http://www.upf.com> ISBN 0-8130-2572-9. Cloth, \$49.95; Flexibind, \$27.95.) Review by Colette Jacono.

This handy softbound book effectively provides an alphabetical list of the 233 species of orchids, their many variants, forms and hybrids, in the United States and Canada. Lacking species descriptions or detailed accounts, this sophisticated reference might better have been titled "An Illustrated Checklist of the Wild Orchids..." The illustrations are fine drawings (though much reduced) and, regrettably, mediocre photographs. Geographical ranges and sundry comments provide interest. Enormous effort has been put into providing concise synonymy and taxonomic references, suggesting that this handbook may be of more interest to the orchid specialist than to the general naturalist. Nevertheless, tucked away in the back of the book is a comfortable and easy to use field key that should be pleasantly rewarding for even the most non-specialized of orchid enthusiasts.

HERBICIDE HANDBOOK - Eighth Edition 2002, edited by W.K. Vencill. 2002. 493 pp.

(Published by Weed Science Society of America, 810 E. 10th ST, Lawrence, KS 66044-8897. ISBN 1-891276-33-6. \$65.00.)

Published periodically since 1967, this large format, easy-to-use reference is still THE BOOK on the subject of technical information about herbicides in production. This edition contains information on 140 chemicals, and is meant especially for research, teaching and extension personnel, as well as for industry and government. The listings are in alphabetical order by chemical name.

Information for each chemical includes common names; manufacturers; chemical structure; molecular formula and weight; physical description; density, solubility and other characteristics; general use; use precautions; behavior in plants; behavior in soil; detailed information on toxicological properties; and references.

TREE ISLANDS OF THE EVERGLADES, edited by F.H. Sklar and A. van der Valk. 2003. 541 pp.

(Published by Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061. ISBN 1-4020-1050-8. \$176.00 plus S/H.)

Anyone who has visited a tree island in the Everglades knows the meaning of enchantment. Being in one of these isolated sanctuaries - drive 50 miles that way, then wade 5 miles this way - is being in Shangri La, a hothouse paradise of rare and wonderful flowers and trees, birds, butterflies, bats and other animals, surrounded by a vastness of sawgrass and swamp lilies.

How do they come to be? Are tree islands safe from the human predilection to alter and "improve", the kind of predilection that is so evident in south Florida and the Everglades?

This book is not a travel-book, it's a scientific book full of graphs, charts and appendices. Turns out that very little study has been done in tree islands in the Everglades or in tree islands of other large wetlands of the world. This book presents the proceedings of the first symposium on the subject, Tree Islands of the Everglades, which was held in July, 1998 at Boca Raton, Florida. The purpose of the meeting was to begin to understand tree islands by laying out what is known about their geology, ecology and archaeology, and then to create a conceptual model of tree islands to "help identify threats to them and how they have or will impact tree island abundance, distribution and condition." The book presents 17 chapters.

LET'S GO AND LOOK AFTER OUR NATURE, OUR HERITAGE, by S.M. Haslam and J. Borg. 2002. 52 pp.

(Published by Ministry of Agriculture and Fisheries, Valletta, Malta. ISBN 99932-0-204-5.)

Talk about thinking globally and acting locally! This booklet is about why and how to declare a "Heritage Place" in the isles of Malta. It's a field guide for environmentalists, nature lovers, students, farmers and others, which informs them how to look at the landscape before their eyes - to value ruderal plant species; to respect ancient

stone walls and cart-ruts; to leave what's there rather than instantly give in to the impulse to develop or "create something different."

Here's food for thought, to help "spark off ideas." So what if the authors, at least one of whom is a world-famous scientist, are acting as proselytizers here? The goal of this booklet is to help the Maltese people to understand: "Keep Our Heritage Ours, Not A Copy Of Another Country's, Or Lost Altogether." Who says scientists shouldn't speak out simply, and unscientifically, in favor of natural and cultural heritage?

INSECTS AND OTHER ARTHROPODS THAT FEED ON AQUATIC AND WETLAND PLANTS, by T.D. Center, F.A. Dray, Jr., G.P. Jubinsky, and M.J. Grodowitz. 1999. 200 pp.

(Published by USDA Agricultural Research Service, Fort Lauderdale, FL. Technical Bulletin No. 1870. (No ISBN Number) For single free copies while they last, contact USDA-ARS, Invasive Plant Research Laboratory, 3205 College Avenue, Fort Lauderdale, FL 33314. To purchase, contact National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; 703-605-6000.)

"The purpose of this manual is mainly to assist in the recognition of these plant-feeding insects and the damage that they cause." The manual includes not only the most common native insects of aquatic and wetland weeds, but also naturalized biological control insects.

Information and excellent large color photographs of native and biocontrol insects that feed on 17 native and non-native plants are presented. Information includes insect ID and history, biology and ecology, effects on host, and literature references. Examples of pictures you'll find include an egg of the duckweed fly and the fly resting on *Lemna* and *Wolffia*; alligator flag (*Thalia polygonum*) damage caused by the *Disonychine* flea beetle; an adult banded sphinx moth eating pollen from the flower of water primrose (*Ludwigia octovalvis*); and the usual shots of insects and damage on alligatorweed, cattail, hydrilla, water hyacinth, and several other plants.

Get your copy while you can.

THE INDUS RIVER - Biodiversity - Resources - Humankind, edited by A. Meadows and P. Meadows. 1999. 441 pp.

(Published by Oxford University Press, 2001 Evans Road, Cary, NC 27513. ISBN 0195 779053. \$50.00 plus S/H. 1-800-451-7556. WWW: <http://www.oup-usa.org>)

This is the proceedings of a symposium held at the Linnean Society, London, July 13-15, 1994. It presents papers on all aspects of the mighty Indus River, which rises in the Himalayas near where China meets Afghanistan, and flows through the entirety of Pakistan, entering the Arabian Sea near Karachi. Section 1 concerns the biodiversity and management of plants and animals of the Indus (the Indus dolphin (*Platanista minor*) was a marine species that adapted into an entirely freshwater species. It used to freely swim the length of the river, but now, due to seven dams on the river, is confined to two relatively short sections); prospects and management of the mangrove, *Avicennia marina*, the predominant mangrove of the Indus delta; effects of pollution; "sustainable management"; and fisheries on the river. Section 2 discusses the Indus's geology and geological evolution, resources, hydropower development, and flooding management. Section 3 presents evidence of thousands of years of human habitation and use of the Indus, and perspectives for the future. One chapter presents a short review of thousands of years of poetry and song about the Indus.

BIOLOGICAL INVASIONS - Economic and Environmental Costs of Alien Plant, Animal and Microbe Species, edited by D. Pimentel. 2002. 369 pp.

(Published by CRC Press, POB 409267, Atlanta, GA 30384-9267. ISBN 0-8493-0836-4. \$129.95 plus S/H. 1-800-272-7737. WWW: <http://www.crcpress.com>)

Chapters are literature reviews about the economic impacts of non-native species. There is information about all sorts of pests, ranging from the papaya fruit fly to the European carp, from Reeves' muntjac to coffee rust, from the Argentine ant to *Melia azederach*. A final chapter deals with the impacts of the world's exotic diseases.

TIDAL MARSHES OF LONG ISLAND SOUND: Ecology, History and Restoration, edited by G.D. Dreyer and W.A. Niering. 1995. 73 pp.

(Published by the Connecticut College Arboretum, 270 Mohegan Ave, Box 5201, New London, CT 06320-4196. Bulletin #34. WWW: <http://arboretum.conncoll.edu> Email: arbo@conncoll.edu)

In 1994, tidal wetlands in parts of the lower Connecticut River were declared "Wetlands of International Importance" by the Ramsar Convention. However, it was the 1961 Connecticut College Arboretum Bulletin No. 12 that sounded the first loud alarm that the state was losing an acre a day of tidal marshes to coastal development, and, subsequently, Connecticut's 1969 Tidal Marsh Act which stopped the destruction of that state's tidal marshes, and which began serious research and preservation efforts. This bulletin represents the culmination of several decades of work to protect and restore tidal marshes. Included are chapters on the geologic history of Long Island Sound; the evolution and development of tidal marshes; tidal wetland ecology; human impacts; tidal wetland restoration; and speculations about the future.

COMMON GRASSES OF FLORIDA AND THE SOUTHEAST, by L.L. Yarlett. 1996. 168 pp.

(Published by the Florida Native Plant Society, POB 6116, Spring Hill, FL 34606. WWW: <http://www.fnps.org>. ISBN 1-885258-05-6)

This book provides pretty good information on the identification, distribution and environmental significance of more than 100 grasses, native and non-native. Each plant also is treated with a southeast U.S. distribution map. Some line drawings accompany the plant descriptions, and color photographs are provided in the center pages of the book (small photos, in the old style of economy books). The book includes a good schematic showing the differences between grasses, sedges and rushes. It also provides good comparison photos of the inflorescences of nine tribes of grasses.

THE NAMES OF PLANTS, by D. Gledhill. 2002. (3rd ed.) 326 pp.

(Published by Cambridge University Press, 40 West 20th St., New York, NY 10011-4211. ISBN 0-521-52340-0. \$25.00 (paperback) plus S/H. WWW: <http://www.cambridge.org>)

Eleocharis comes from Greek, *heleo*, meaning "marsh," and *charis*, meaning "beauty." *Precatorius* of *Abrus precatorius* (rosary pea), means "pertaining to prayer." *Nephrolepis* means "kidney scale," the shape of the indusia of the sori of certain ferns, such as *Nephrolepis cordifolia*.

This interesting book shows that botanical names have come from former common names, and that English plant names derive from about a dozen other languages. The author describes the rules of nomenclature and botanical terminology, but the most fun part is the alphabetized 300-page glossary for looking up names and name parts.

Paederia means "bad smell." *Nuphar* comes from the ancient Latin, *nenuphar*, which was taken by the Persians to mean "water-lily." *Bidens* refers to "two teeth," which are the scales found at the fruit apex...

FLOOD PULSING IN WETLANDS - Restoring the Natural Hydrological Balance, edited by B. Middleton. 2002. 308 pp.

(Published by John Wiley & Sons, WWW: <http://www.wiley.com> ISBN 0-471-41807-2.)

The flood pulse concept has to do with seasonal changes in water levels in rivers, salt marshes and mangrove swamps, and the relationships of flood pulsing to production, decomposition and consumption. This book is a compilation of research in the field of wetlands restoration involving the use of flood pulsing. Included are descriptions of reduced pulsing due to projects in the American southwest; vegetation and fish declines caused by the absence of pulsing in the middle Rio Grande; the effects of dams and levees on plants in the Illinois River; and "the most famous case concerning the use of flood pulsing in the restoration of an entire landscape": the Kissimmee River floodplain ecosystem in Florida.

AQUATIC AND WETLAND PLANTS OF THE WESTERN GULF COAST, by C. D. Stutzenbaker. 1999. 466 pp.

(Published by Texas Parks and Wildlife Press. WWW: <http://www.tpwd.state.tx.us/news/press/> ISBN 1-885696-31-0)

The western Gulf Coast extends from the Pearl River south and west to the Rio Grande, more or less from New Orleans to Brownsville, TX. In this large-format book, the native and non-native aquatic and wetland plants are arranged according to growth characteristics: free-floating; rooted and rootless submerged, rooted with floating leaves, emergents with blue flowers, etc. Very good photos are in B/W, accompanied by line drawings. Each plant is described by habitat, wildlife values, propagation, management and similar species.

ADVANCES IN MEXICAN LIMNOLOGY: Basic and Applied Aspects, edited by J. Alcocer and S.S.S. Sarma. 2002. 228 pp.

(Published by Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061. ISBN 1-4020-0621-7)

Included in this Proceedings from Mexico's first National Limnological Conference (1999) are 14 papers (reprinted from *Hydrobiologia* v 467, 2002) on basic and applied limnology of Mexico. Included is information about two new species of freshwater crustaceans; a new fairy shrimp from the desert; the microstructure of a cave troglobyte; phytoplankton of caves; phytoplankton of lakes; zooplankton; oligochaetes; fish of Lake Patzcuaro; birds of a central plateau reservoir; remote sensing; and data about the water quality of Lake Chapala, Mexico's largest lake.

AQUATIC AND WETLAND PLANTS OF SOUTHWESTERN UNITED STATES (Returned to Print), by D.S. and H.B. Correll. 2002. 2 Volumes, 1,777 pp.

(Published by Blackburn Press, POB 287, Caldwell, NJ 07006, 973-228-7077, Fax 973-228-7276, \$124.95. ISBN 1-930665-52-0 <http://www.blackburnpress.com/aqandwetplan.html>)

Books - Cont'd.

Originally published in 1972, and reissued in 1975, this standard in the field has been returned to print unchanged. The authors identify ferns and flowering plants in aquatic and wetland habitats of Arizona, New Mexico, Oklahoma, and Texas. However, many of the plants described extend far beyond this range. The volumes include taxonomic treatments of approximately 2,100 species and almost 800 pages of excellent line drawings. Common names are given for each species.

by P.H. Nienhuis and R.D. Gulati. 2002. 233 pp.

(Published by Kluwer Academic Publishers, POB 17, 3300 AA Dordrecht, The Netherlands, +31 (0)78-6576266. US\$91., GBP 61, Euro 95.)

Contributions to this book are from invited Dutch experts in ecological restoration of aquatic and semi-aquatic ecosystems. The volume contains 10 case studies, roughly covering all such ecosystems in the Netherlands, and includes coastal areas, salt marshes, rivers, lakes, fens, streams, wetlands, and dune slacks.

Invasives, edited by C.R. Veitch and M.N. Clout. 2002. 414 pp. (Occasional Paper of the IUCN Species Survival Commission No. 27)

(Available from IUCN Publications Services Unit, 219c Huntingdon Rd, Cambridge CB3 0DL, UK, +44 1223 277894, E-mail: books@iucn.org, WWW: www.iucn.org/bookstore, US\$36.75 GBP 24.50)

Papers and abstracts from the International Conference on Eradication of Island Invasives held at the University of Auckland, 19-23 February 2001. The conference focused on the eradication of invasive species from islands: methods used and results achieved. Papers discuss the eradication of cats, rats, rabbits, goats, possums and other mammals, insects, amphibians, and grasses and other invasive plants.

ECOLOGICAL RESTORATION OF AQUATIC AND SEMI-AQUATIC ECOSYSTEMS IN THE NETHERLANDS (NW EUROPE), edited

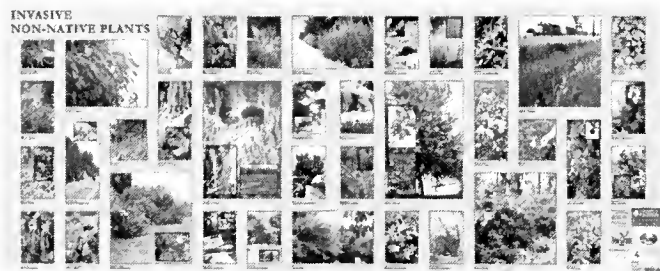
TURNING THE TIDE: THE ERADICATION OF INVASIVE SPECIES - Proceedings of the International Conference on Eradication of Island

HUNDREDS

OF PLANT IDENTIFICATION PHOTOGRAPHS



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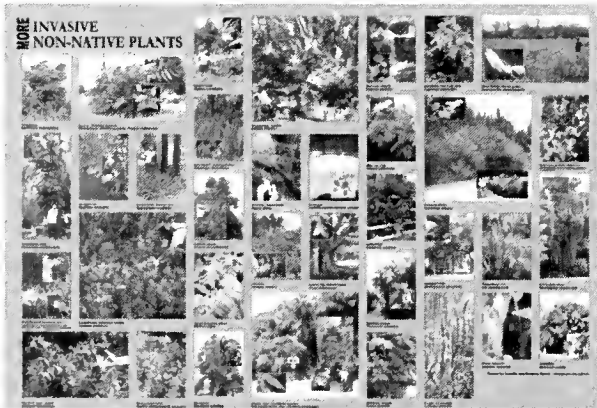
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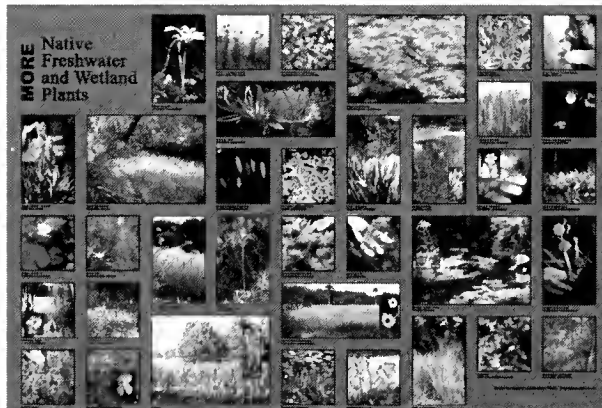
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UNIVERSITY OF FLORIDA'S CENTER FOR AQUATIC AND INVASIVE PLANTS

Closest relatives of *Pistia stratiotes* resolved with combined chloroplast and mitochondrial DNA sequences

by Dr. Susanne Renner, Menzinger Strasse 67, D-80638 Munich, Germany, renner@lrz.uni-muenchen.de, and Dr. Libing Zhang, Department of Biology, Colorado State University, Fort Collins, CO 80523, Libing.Zhang@ColoState.edu

Drs. Susanne Renner and Li-Bing Zhang, systematists at the Missouri Botanical Garden and the University of Missouri-St. Louis, have identified the closest relatives of *Pistia stratiotes*. They used sequences from three sections of chloroplast DNA, called 'introns' and 'spacers' because they are inserted between and inside genes, and one intron in a mitochondrial gene. (A manuscript on their discovery has been submitted and the sequences have been made public in the genetic sequence database GenBank, an annotated collection of all publicly available DNA sequences which also contains the human sequence.)

Previous hypotheses about the relationships of *Pistia* had to be based on morphology, which in the case of *Pistia* is difficult to interpret because of the much-condensed reproductive structures. The great morphological distinctness of *Pistia* is reflected in classifications of Araceae, which place this single species in a subfamily or tribe by itself.

The figure below is a phylogenetic 'tree' (drawn as a circle) based on all combined sequences. The tree represents the most likely relationships between *Pistia* and its closest relatives in the Araceae family, given the data and a model of sequence evolution based on the specific sequences in the analysis. The numbers on the branches represent statistical confidence (100 is the highest possible level).

Pistia stratiotes appears in the lower right, and it is the sister group to the entire circle of genera 'above it' in the tree. In other words, *Pistia* is not closely related to any single living species. Rather, its ancestor diverged from the ancestor of all the genera in the tree before those other genera had diversified.

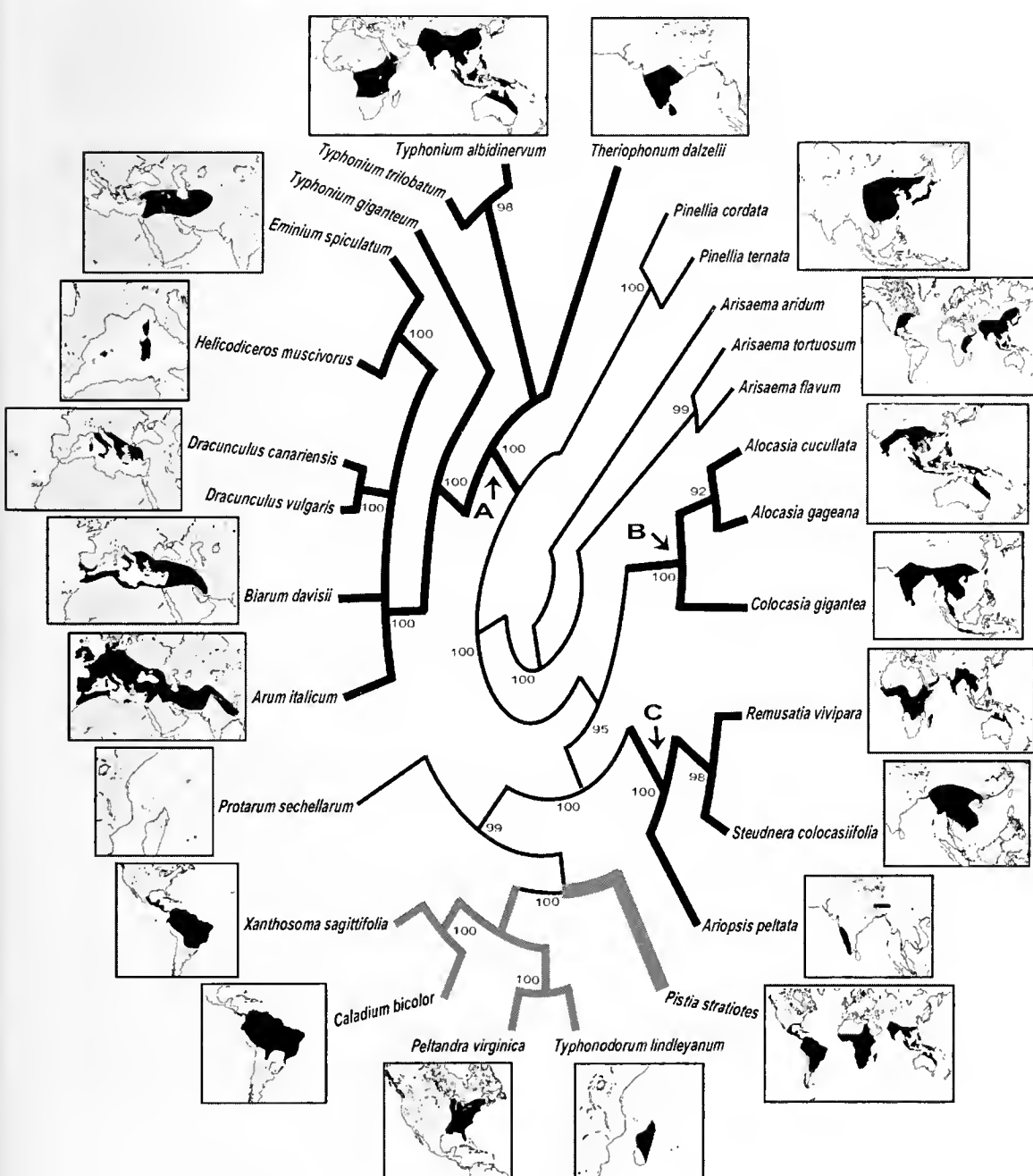
Most of the genera in the 'tree' have but a few species, but a few, such as jack-in-the-pulpit (*Arisaema*, with 150 species), are species rich. The distribution maps next to the genera show that the species related to *Pistia* all occur in the Old World tropics. The only

exceptions are three species of jack-in-the-pulpit that entered North America across the Bering land bridge, sometime in the Miocene as indicated by 16-18 million year old fossils from Spokane. The oldest fossils of *Pistia* are seeds from the Late Oligocene/Early Miocene (24 million years) of Europe and Russia. These fossils, however, 'underestimate' the true age of *Pistia* because some of the genera in the *Pistia* sister group have 45 million year old fossils. Also, the group at the very bottom of the tree, *Peltandra* (in Florida) and *Typhonodorum*, are known from 60 million year old leaves from the Late Paleocene/Eocene of eastern Europe, Kazakhstan, North Dakota, and Tennessee (Wilde et al., in press).

The combined molecular and fossil evidence led the researchers to infer that the early evolution of *Pistia* took place between 60 and 45 million years ago somewhere around the Tethys sea, that is the proto-Mediterranean sea which opened into the Indian Ocean, and that *Pistia* in geologic terms may be a relative newcomer to the New World tropics. More detailed comparisons of gene sequences from different populations of *Pistia* are needed to test whether New World *Pistia* populations on average are younger than Old World *Pistia* populations. It is tricky, however, because *Pistia* is so mobile, and there is likely to have been much local extinction, followed by re-invasion.

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FROM THE DATABASE

Here is a sampling of the research articles, books and reports which have been entered into the aquatic, wetland and invasive plant database since Winter 2003.

The database contains more than 60,000 citations. To use the free APIRS database online, go to <http://plants.ifas.ufl.edu/> and click on APIRS Online Database.

To obtain articles, contact your nearest state or university library, or a document delivery service (see page 3).

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MEETINGS

INVASIVE PLANTS CONFERENCE.

August 6-7, 2003. University of Pennsylvania.

"This conference brings together experts from the front lines of research, the green industry, policy, funding, education, and on-the-ground management who are working together to solve this problem." Presented by the Mid-Atlantic Exotic Pest Plant Council, Morris Arboretum of the University of Pennsylvania, The Nature Conservancy, Penn State Cooperative Extension, and others.

Contact: The Morris Arboretum, 215-247-5777 x159 or www.upenn.edu/paflora or mabxeduc@pobox.upenn.edu

8th CONFERENCE OF THE INTERNATIONAL SOCIETY FOR PLANT ANAEROBIOSIS (ISPA).

September 20-24, 2004. Perth, Western Australia.

The ISPA is composed of scientists interested in the mechanisms of acclimation and adaptation of plants to poorly aerated environments. Plants studied include those inhabiting marine, aquatic, salt marsh, and wetland environments; and terrestrial ecosystems subjected to seasonal episodes of waterlogging or submergence (including crop species and agricultural systems). See <http://www.ibba.cnr.it/ispa/>

Contact: Tim Colmer, University of Western Australia, School of Plant Biology, 35 Stirling Highway, Crawley 6009 WA, Australia, tdcolmer@cyllene.uwa.edu.au

30th ANNUAL NATURAL AREAS CONFERENCE.

September 24-27, 2003. Monona Terrace Convention Center, Madison, WI.

"Defining a Natural Areas Land Ethic" is the theme of the conference hosted by the Natural Areas Association and the Wisconsin Department of Natural Resources' Endangered Resources Program. Presentations on natural area identification, protection and management, restoring natural communities, rare species conservation, developing a land ethic, and forums on landscape ecology, large river systems, fire ecology, and private lands protection. On September 27th, an **Invasive Plants Symposium** will be co-hosted by the Invasive Plants Association of Wisconsin to focus on identification, management and control techniques for invasive plants of the upper Midwest.

Contact: www.naturalarea.org or Thomas Meyer, thomas.meyer@dnr.state.wi.us or 608-266-0394.

27TH ANNUAL FLORIDA AQUATIC PLANT MANAGEMENT SOCIETY TRAINING CONFERENCE.

October 14-16, 2003. Adam's Mark Hotel, Daytona Beach, FL.

This year's FAPMS conference will include a Resource Demonstration with potential programs on plant identification, venomous insects, GIS technology, and snake identification. An Aquatic Plant Manager of the Year is selected and awarded, and papers are solicited from "field applicators" as well as the traditional researchers.

Contact: David Farr, FAPMS Treasurer, dfarr@co.volusia.fl.us or 386/424-2920.

30th ANNUAL CONFERENCE ON ECOSYSTEMS RESTORATION AND CREATION.

October 30-31, 2003 (conferences previously held in May). Hillsborough Community College, Tampa, FL.

The annual conference provides a forum for the nationwide exchange of results of the latest scientific research on restoration, creation, and management of not only freshwater and coastal wetland systems but also total ecosystems including upland and transitional areas. Topics include freshwater and marine wetland systems; upland systems, marsh, mangrove, and seagrass restoration; upland and mixed ecosystem restoration; mitigation, permitting and regulatory policies; mine reclamation, and management techniques.

Contact: Frederick Webb, fwebb@hccfl.edu or pcannizzaro@hccfl.edu or www.hccfl.edu/depts/detp/eco-conf.html or 813-757-2148.

INVASIVE PLANTS IN NATURAL AND MANAGED SYSTEMS: LINKING SCIENCE AND MANAGEMENT.

November 3-7, 2003. Wyndham Bonaventure Resort, Ft. Lauderdale, FL.

A joint conference and workshop, co-hosted by the Ecological Society of America and the Weed Science Society of America in conjunction with the 7th International Conference on Ecology and Management of Alien Plant Invasions.

Contact: <http://www.esa.org/ipinams-emap7/>

23RD INTERNATIONAL SYMPOSIUM OF THE NORTH AMERICAN LAKE MANAGEMENT SOCIETY.

November 4-8, 2003. Foxwoods Resort, Mashantucket, Connecticut.

Protecting Our Lakes' Legacy is the theme for the NALMS 2003 symposium. Learn together and share cases of real world projects with citizens, scientists, lawmakers and lake managers.

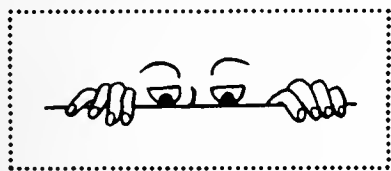
Contact: www.nalms.org

WASTEWATER HYGIENISATION IN CONSTRUCTED WETLANDS, PONDS AND RELATED SYSTEMS.

November 6-7, 2003. UFZ Centre for Environmental Research, Leipzig-Halle, Germany.

"Providing unpolluted water turns out to be an increasing problem for many countries throughout the world. Since natural resources are restricted, the main policy to tackle this problem is to improve water management and to reuse adequately treated wastewater. . . The purpose of our meeting is to summarize the present knowledge and to discuss solutions optimizing the processes."

Contact: www.ufz.de/spb/phyto or hygienisation@rz.ufz.de or +49 341/235-2413. **Conference will be in English.**



APIRS Picks:

The population of *Myriophyllum quitense* (Haloragaceae) at Laguna Toro in the high Andes of Bolivia was noteworthy for possessing some unusual characteristics. Numerous individuals (ca. 5-10% of the population) were noted with leaves arrayed in 5-merous whorls. By contrast, *M. quitense* typically possesses leaves in 4-merous (occasionally 3-merous) whorls (Orchard 1981). Leaves in 5-merous whorls have only been reported for the species from a single herbarium specimen from North America (Orchard 1981), and, more recently, from Cochabamba's Laguna Alalay (Ritter and Crow 1998).

Ritter, N.P. 2000. *Biodiversity and Phytogeography of Bolivia's Wetland Flora*. Ph.D. Thesis, University of New Hampshire, 399 pp.

Where the species [*Nelumbo lutea*] occurs in pure stand the rhizomes form a complex underground network which totals a length of 45 miles per acre. The rate of colonization is phenomenal since a small patch was observed to extend itself radially an average of 45 feet in one growing season. This represents a growth rate of 0.23 feet per day for the entire summer. On this basis six properly spaced patches of lotus (10 feet across) would produce an acre of lotus during one growing period.

Hall, T.F., and Penfound, W.T. 1944. *The Biology of the American Lotus, Nelumbo lutea (Wild.) Pers.* American Midland Naturalist 31(3):744-758.

Management of nonindigenous species is a crucial aspect of maintaining native biodiversity and normal ecosystem functions. We attempt to guide researchers in developing projects that will be of use to conservation practitioners, tangibly improving applied conservation measures. We advocate a directed approach for conservation research to aid in prioritizing nonindigenous species for intervention by resource managers. This approach includes outlining what needs to be known to make

such relative judgments about the impacts of nonindigenous species and the most promising methods by which to obtain such information. We also address active measures that should be taken once priorities have been set, highlighting the roles of risk assessment and research in improving control efforts. Ultimately, a better match between research and practical conservation needs should result in more effective reduction of the effects of nonindigenous species on native species.

Byers, J.E., Reichard, S., Randall, J.M., et al. 2002. *Directing Research to Reduce the Impacts of Nonindigenous Species*. Conservation Biology 16(3):630-640.

We present the results of a 14-year common garden experiment with the Chinese Tallow Tree (*Sapium sebiferum*) from its native range (Asia), place of introduction to North America (Georgia) and areas colonized a century later (Louisiana and Texas). Invasive genotypes, especially those from recently colonized areas, were larger than native genotypes and more likely to produce seeds but had lower quality, poorly defended leaves. Our results demonstrate significant post-invasion genetic differences in an invasive plant species. Post-introduction adaptation by introduced plants may contribute to their invasive success and make it difficult to predict problem species.

Siemann, E., Rogers, W.E. 2001. *Genetic Differences in Growth of an Invasive Tree Species*. Ecology Letters 4:514-518.

In an effort to help modernize neotropical plant studies and to make GIS more accessible to botanists, The New York Botanical Garden has developed a digital base map of the Americas with multiple registered map layers that can be superimposed in any combination and may be used to create digital distribution maps from collection lists for dissemination and analysis. The Americas Base Map may be utilized by any botanist affiliated with a nonprofit institution and with access to ArcView®, and it is available on CD or in electronic form by request.

http://www.nybg.org/bsci/digital_maps/
Bletter, N., Janovec, J., Brosi, B., et al. 2003. *A Digital Basemap for Studying the Neotropical Flora*, The New York Botanical Garden.

We report that an eelgrass bed *Zostera marina* L. at the Aland Islands, northern Baltic Sea, is dominated by a single genotype which extends over an area of approximately 160x40 m. . . To our knowledge, it represents the largest marine plant identified thus far. Based on estimates of horizontal rhizome growth rates, this clone may be more than 1000 years old. The remarkable phenotypic plasticity of a single genotype which dominates this site illustrates that there is no simple one-to-one relationship between genetic diversity and population persistence in changing and stressful environments.

Reusch, T.B.H., Bostrom, C., et al. 1999. *An Ancient Eelgrass Clone in the Baltic*. Marine Ecology Progress Ser. 183:301-304.

Journals for Sale

The Aquatic Plant Management Society, Inc. (APMS) has complete sets of back issues of the *Journal of Aquatic Plant Management* for sale (four issues are available as photocopies only.) The set of journals represents forty years of research into the management of aquatic plants. The semi-annual *Journal* was first published in August 1962, with the most recent issue being Volume 41, January 2003.

Sets are priced at \$250.00, plus postage. The average cost of shipping to a U.S. address is \$25.00 (parcel post rate), and to an international address \$35-\$40 (economy rate). The APMS treasurer can accept credit cards or checks as payment.

Contact Dr. Linda Nelson, USAERDC-WES, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, 601.634.2656. E-mail: Linda.S.Nelson@erdc.usace.army.mil

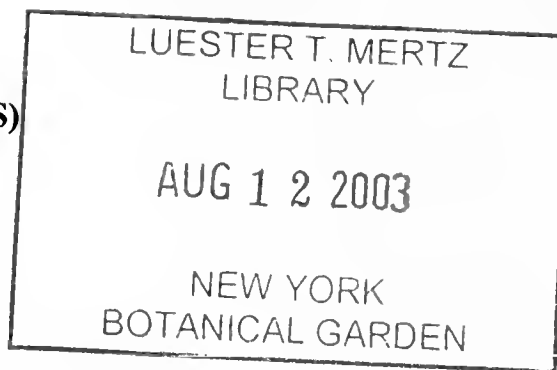
New Journal

Conservation in Practice, a magazine of conservation science, policy, and practice and their on-the-ground implications, from the Society for Conservation Biology in partnership with Conservation International, The Nature Conservancy, the U.S. Fish & Wildlife Service, the National Park Service, World Wildlife Fund, and NOAA.

Society for Conservation Biology, 4245 N. Fairfax Dr., #400, Arlington, VA 22203, 703-276-2384, www.conservationbiology.org

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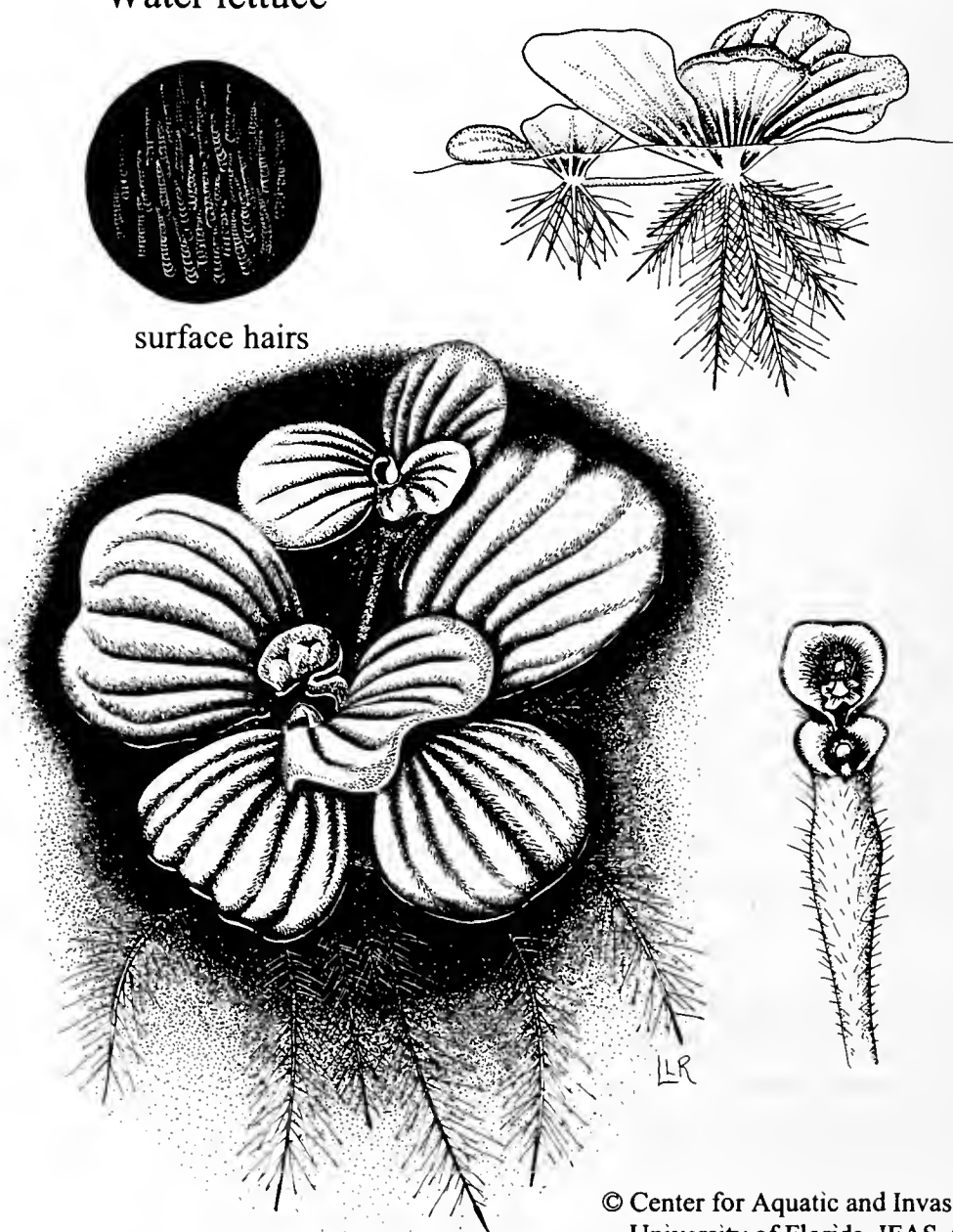
This is the newsletter of the Center for Aquatic and Invasive Plants and the Aquatic, Wetland and Invasive Plant Information Retrieval System (APIRS) of the University of Florida Institute of Food and Agricultural Sciences (IFAS). Support for the information system is provided by the Florida Department of Environmental Protection, Bureau of Invasive Plant Management, the U.S. Army Corps of Engineers, Waterways Experiment Station, Aquatic Plant Control Research Program (APCRP), the St. Johns River Water Management District, and UF/IFAS.

**EDITORS: Victor Ramey
 Karen Brown**

AQUAPHYTE is sent to managers, researchers and agencies in 71 countries around the world. Comments, announcements, news items and other information relevant to aquatic and invasive plant research are solicited.

Inclusion in AQUAPHYTE does not constitute endorsement, nor does exclusion represent criticism, of any item, organization, individual, or institution by the University of Florida.

Pistia stratiotes
 Water lettuce



© Center for Aquatic and Invasive Plants
 University of Florida, IFAS, Gainesville

Learn about *Pistia stratiotes* and its closest relatives in a phylogenetic 'tree' on page 9.

AQUAPHYTE

A NEWSLETTER ABOUT AQUATIC, WETLAND AND INVASIVE PLANTS

Center for Aquatic and Invasive Plants

with support from

The Florida Department of Environmental Protection,

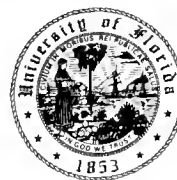
Bureau of Invasive Plant Management

The U.S. Army Corps of Engineers,

Waterways Experiment Station,

Aquatic Plant Control Research Program

The St. Johns River Water Management District



UNIVERSITY OF FLORIDA

Institute of Food and Agricultural Sciences

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ANNOUNCING

<http://plants.ifas.ufl.edu/guide>

The first COMPLETE web site about aquatic plant management in Florida

We are in the 18th month of a 24-month production of *Aquatic Plant Management in Florida Waters, A Web Site For The Interested Public*. Much of it is online already, awaiting your attention. ("We" are the University of Florida IFAS Center for Aquatic and Invasive Plants and the Florida DEP Bureau of Invasive Plant Management.)

Florida is home to 8,000 lakes, 1,700 rivers, thousands of miles of canals, 400 springs, a half-dozen aquifers, millions of acres of marshes and swamps, and 14 million people. Each lake, each river and each acre of marsh is unique, often home to native plants and animals, often threatened by non-native invasive plants, and often surrounded by happy homeowners, many of whom have their own ideas about what their waterbody should be like. Talk about aquatic plant management problems!

<http://plants.ifas.ufl.edu/guide> is here to help explain Florida's watery ecosystems, the need for their management, and the methods used for their management. The goal of the web site is:

- ◆ to help citizens, long-time and recently-arrived, understand plants and their management in Florida waters
- ◆ to help field workers, office supervisors, management agencies, elected boards and government officials, eco-advocacy groups, legislators and others understand plants and their management in Florida waters.

Come visit this 500+ page, 3,000 photograph web site, click on the major topics, or scroll down to the large index of keywords.

APIRS Users

Does anyone actually use APIRS? You bet!

Following are some usage statistics for the APIRS web site:

Time frame: 30 days, November 2003

Average hits: at 4AM, 620 hits/hour;

at 3PM, 3,368 hits/hour (56 hits/min)

User sessions/month: 78,234 (an average of 2,607 user sessions/day.)

Users view 137,112 jpeg images/ month and 194,472 html pages/month.

Among the most frequently accessed parts of the web site:

Plant photos/drawings, 137,112 jpeg image downloads/month;

Database, 5,892 searches/month.

In addition to basic support from the University of Florida, Institute of Food and Agricultural Sciences, the APIRS office of the Center for Aquatic and Invasive Plants is especially appreciative of the generous support of the Aquatic Plant Control Research Program of the Army Corps of Engineers.

In addition, significant support is received from the Florida Department of Environmental Protection, Bureau of Invasive Plant Management. The DEP Bureau was the original sponsor of the database, and also currently supports web site development, public education and manager education projects.

Other necessary and much appreciated support has come from the St. Johns River Water Management District, the U.S. Army Corps of Engineers - Jacksonville District, and Cerexagri.

U.S. Invasive Species Advisory Committee (ISAC) - A Brief Overview

by Randall K. Stocker, Director of the UF-IFAS Center for Aquatic and Invasive Plants and Chair of ISAC

In February 1999, the Clinton Administration responded to pressure from scientists, resource managers, environmentalists, and many others by issuing **Executive Order 13112, Invasive Species**. Among other provisions, the Executive Order required the Secretary of Interior to establish an advisory committee "to provide information and advice for consideration by the [Invasive Species] Council." The Invasive Species Advisory Committee (ISAC), as it came to be called, was to be composed of individuals "representing stakeholders," with a broad definition of who would be considered stakeholders in the invasive species issue, including non-federal government agencies, the scientific community, non-governmental organizations, trade groups, commercial interests, and private landowners. This group would be asked to "...recommend plans and actions at [local to ecosystem-based] levels to achieve the goals and objectives of the Management Plan," also called for by the Executive Order. These recommendations would be addressed to the "Invasive Species Council" (now the "National Invasive Species Council" or NISC), composed of the Secretaries of State, Treasury, Defense, Interior, Agriculture, Commerce, Transportation, and the Administrator of the Environmental Protection Agency. NISC is co-chaired by the Secretaries of Interior, Agriculture and Commerce. There is currently a small staff, lead by Executive Director of the Council Lori Williams.

The goals of the NISC/ISAC process included efforts to prevent the introduction of invasive species; detect and respond rapidly to control invasive species; monitor invasive species populations; restore native species and habitats; and promote public education.

The first ISAC meeting was held in January 2000 in Washington, DC, and ISAC members were appointed for two-year terms. Since then, ISAC has met three times per year, with the most recent meeting held 29-30 October 2003. I was appointed to the first ISAC group, and re-appointed in April 2002 for a second term, serving as ISAC chair. With the approaching conclusion of my

second term (my last meeting will be March 2004), this is an appropriate time to review some of the expectations for ISAC and the subsequent performance of the partners in this process.

At the first meeting, the Advisory Committee was asked to help executive branch agencies target resources and address invasive species issues in a coordinated fashion to identify threats and eradicate invasives where possible. We were asked to outline policy options, and to strive for practical, budget-based recommendations from the best available science on resource management. Members were informed that their deliberations would have far reaching consequences, even international importance.

Results thus far: The Executive Order and the General Accounting Office have asked federal agencies to identify current federal expenditures on invasive species, an important starting point for tracking total federal budget allocations. ISAC assisted in the development of this country's first National Invasive Species Management Plan. There has been a general increase in awareness of the invasive species issue by federal agency, Congressional, and state agency staff. Public awareness has increased as the media reports on new problems. Academic programs reflect this increase in awareness as more campuses develop curricula on invasive species and new centers/institutes are created. There are still many areas where progress has been limited or non-existent: deadlines in the National Management Plan were too optimistic and most have been missed; changes in administration and staffing have delayed progress; and the fundamental role that the Advisory Committee could play with members of the National Invasive Species Council has not clearly been defined. Still, significant progress has been made that deserves recognition, and the scientific community, and especially professional societies such as the **Weed Science Society of America** and the **Aquatic Plant Management Society**, were key factors in that progress.

For more information, go to: www.invasivespecies.gov

U.S. Agency 'AIMS' at Internet Sales of Banned Plants

"The U.S., jolted into action by the mushrooming magnitude of invasive plants and the damage they have wrought--and continue to cause-- has launched a new, internet-based effort to choke off domestic retail sales of banned plants as one phase of a strategy to limit further introduction and spread of invasive plant species."

Scientists at the Center for Integrated Pest Management (CIPM) at North Carolina State University, together with the U.S. Department of Agriculture Animal and Plant Health Inspection Service (USDA/APHIS), have developed a "web-crawler," software that searches the internet for web sites selling plants officially defined as noxious weeds or invasive species*. The system, **Agricultural Internet Monitoring System (AIMS)**, will be used primarily to locate, then notify, offending vendors, according to R.E. Stinner, lead researcher on the AIMS program.

Vendors identified by AIMS as offering banned species online

will be notified and directed to stop selling the plants. AIMS will then keep track of retailers who continue to sell illegal plants; refusal to comply with notification can lead to prosecution and the possibility of substantial fines.

Depending on performance and results from the AIMS program, federal officials will consider developing a cooperative effort with equivalent organizations in other countries. Authorities in Australia, New Zealand, and South Africa have expressed an interest in some form of joint effort.

*The **USDA/APHIS Regulated Pest List** can be accessed at: <http://www.aphis.usda.gov/ppq/regpestlist/> or in PDF format at: <http://www.invasivespecies.org/RegulatedPestList.pdf>

Pests other than weeds are listed (viruses, insects, bacteria, etc.)

For more information, contact Ron_Stinner@ncsu.edu, CIPM, North Carolina State University, 919-515-1648.

To report internet sites offering prohibited plants for sale, contact Sherrena.A.Harrison@aphis.usda.gov

LOOKING BENEATH THE SURFACE

by Mary Langeland, University of Florida, Center for Aquatic and Invasive Plants, APIRS

As the one who assigns keywords and categories to the thousands of articles, books, and miscellaneous printed materials for the Aquatic and Invasive Plant Information Retrieval System (APIRS), I thoroughly enjoy the occasional "oddity" that crosses my desk. After reviewing and cataloguing hundreds of "regular articles" published in refereed journals or reports by government agencies or books written by earnest authors on the value of biodiversity or environmental implications of plant invasions, imagine my delight when an out-of-the-ordinary piece of literature appears in the stacks of papers and books cluttering my office. It causes me to take stock and, so to speak, "look beneath the surface."

The human face of science usually characterizes these serendipities. The sheer delight and joy that the researcher experiences rarely shines through in the scientific literature - it is *de rigueur* to be detached and unbiased. But, as humans, we are not just workers; rather, we respond to our work and our environment.

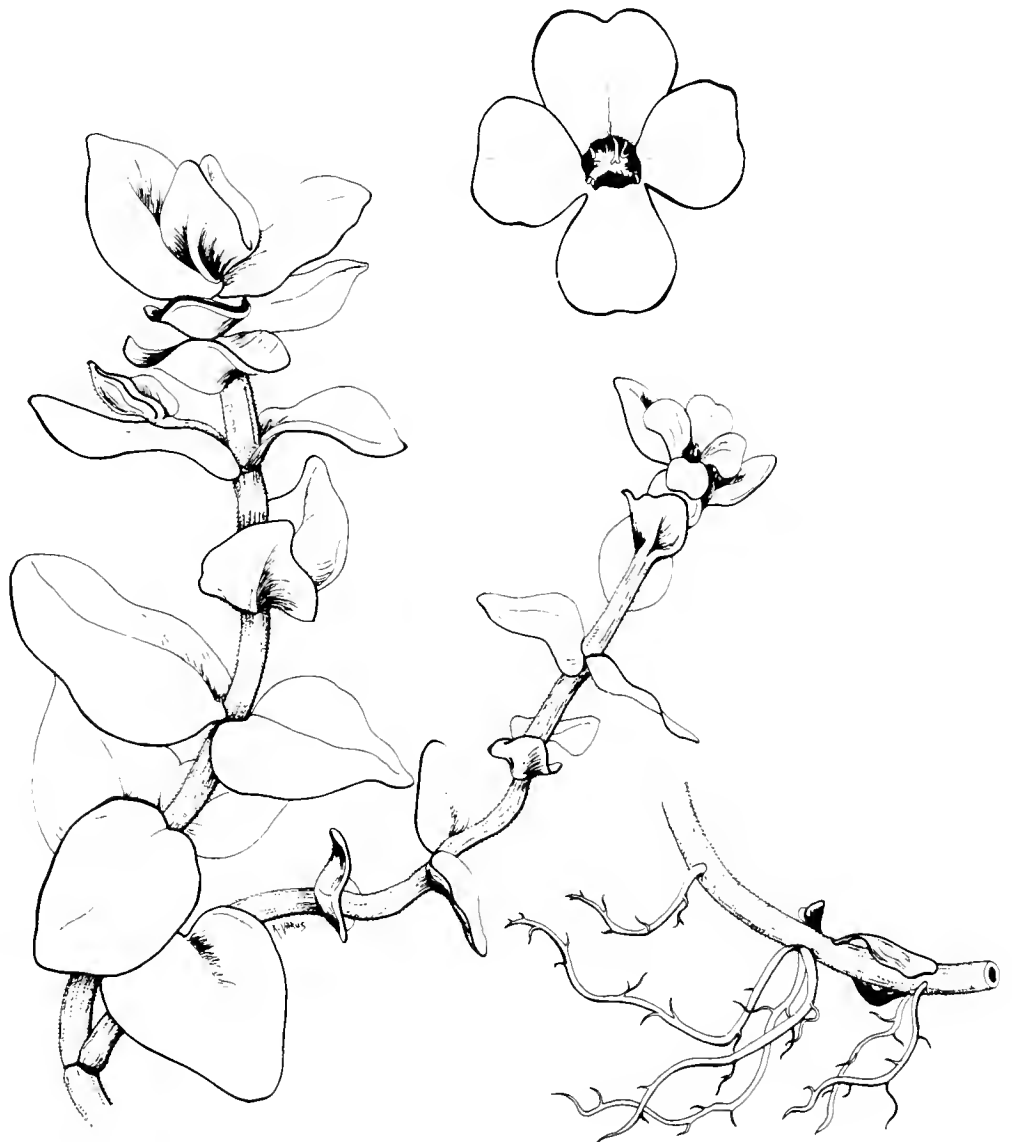
Let me share one such gem with you - **Flowers of Marsh and Stream** by Iolo A. Williams (Penguin Books, Ltd., Harmondsworth, Middlesex, England, 1946). Williams saw that

... the winter ponds and streams have their beauty of vegetation, too - not on the banks or near the shores, where the coots and water hens tread sodden alleyways among the dead and broken stems and leaves of *Typha* and *Sparganium*, but in the clear depths where the tufts of water starwort wave rhythmically to and fro as the current glides past. On a winter's day they can, seen through the glistening pellucid stream as one peers down to its sandy bottom, seem the greenest thing in the whole landscape. (p. 5)

This kind of writing attracts attention because of its insight into *why* the scientist or researcher does what they do. Perhaps you have stood on the banks of a clear stream and seen the incomparable beauty of the natural world, your heart was touched and a desire to protect, preserve and understand this priceless treasure was born and you were lead to seek a career in the environmental sciences. In that moment your spirit sought to understand the mystery behind the creation, behind "the greenest thing in the whole landscape."

Editor's Note: Mary Langeland has performed one of our most important functions at APIRS for the last fifteen years: the cataloging of literally thousands of citations in the APIRS database. Mary truly looks beneath the surface to understand the mystery behind the creation. She is an invaluable asset both to us and to all users of the APIRS database. *Thank you Mary!*

Bacopa caroliniana
Blue-hyssop



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University of Florida, Gainesville

Books/Reports

INVASIVE PLANT SPECIES OF THE WORLD - A reference guide to environmental weeds, by E. Weber. 2003. 548 pp.

(Published by CABI Publishing, Oxford, England. ISBN 0851996957. Order from Oxford University Press, 2001 Evans Road, Cary, NC 27513. WWW: <http://www.oup.com/us>)

Want to know where an invasive plant is from, and where it is already invasive? This comprehensive primary reference book focuses on more than 400 non-agricultural plant species, and includes global distributions for the plants, where they are native and where they are already invasive.

For each species, the author includes their growth form, synonymy, commercial use, global distribution, types of habitats invaded, ecology, and best control methods, as well as primary references.

UNDERSTANDING WETLANDS - Fen, bog and marsh, by S.M. Haslam. 2003. 296 pp.

(Published by Taylor and Francis, 11 New Fetter Lane, London EC4P 4EE, Great Britain. ISBN 0-415-25794-8. \$85.00 plus S/H, hardbound. WWW: <http://www.tandf.co.uk>)

This "holistic" book, written by a lively scientist of distinction, concentrates on wetland habitat, vegetation, animals and humans, and the interactions between them. It is intended as a primer suitable for college students, conservationists and agency workers. In it, terminology is discussed (wetland is an American term which has jumped to Europe; according to the author, wetland names from Dr. Johnson's dictionary (1755) include bog, fen, marsh, meadow, mire, moor, moorland, morass, quagmire, slough, swamp); the World Charter for Nature is reviewed (the U.N.'s official view on nature: who knew?); wetland functions are presented; soil chemistry is related to plants present; and plant behaviour and human use of *Phragmites* is discussed. Finally, a fresh and understandable view of vegetation dynamics, including plant invasions, is presented as The Silent Battlefield.

INVASIVE AQUATIC PLANTS - A guide to the identification of the most important and potentially dangerous invasive aquatic and wetland plants in South Africa, by L. Henderson and C.J. Cilliers. 2002. 88 pp.

(Published by Plant Protection Research Institute, Handbook No. 16, Pretoria, South Africa. ISBN 1-86849-254-0. Order from ARC-PPRI Publications, Private Bag X 134, Pretoria, 0001, South Africa. \$11.72 plus S/H. Email: nipbhc@plant1.agric.za)

This colorful handbook is by Lesley Henderson, who has studied invasive plants of South Africa for the past 23 years, and Carina Cilliers, a biocontrol expert for lantana, water hyacinth, salvinia, water lettuce and parrot's feather.

Twenty-one aquatic weeds are described and illustrated with numerous color photos and plant line drawings. Biocontrol efforts for many of the plants also are pictured and described. (Twenty color pictures of plants and biocontrol results are included in the water hyacinth section.) South African distribution maps for each species also are featured.

Eighteen of these 21 South African aquatic weeds also are non-native aquatic weeds of the U.S.; three of their aquatic weeds are native plants of Florida (*Nymphaea mexicana*, *Cabomba caroliniana* and *Pontederia cordata*).

TURNING THE TIDE - Saving the Chesapeake Bay, by T. Horton. 2003. 386 pp.

(Published by Island Press, 1718 Connecticut Avenue NW, Suite 300, Washington, DC 20009-1148. ISBN 1-55963-549-5. \$18.95 plus S/H.)

This new edition of the original 1991 book, sponsored by the Chesapeake Bay Foundation, "addresses new developments of the past decade and examines the factors that will have the most significant effects on the health of the bay in the coming years." It includes new case studies, updated maps, charts and graphs.

"How can we ensure that the next decade does not end like the last, with numerous battles won but little progress made?"

LIVING RESOURCES AND HABITATS OF THE LOWER CONNECTICUT RIVER, edited by G.D. Dreyer and M. Caplis. 2001. 79 pp.

(Published by the Connecticut College Arboretum, Campus Box 5201, 270 Mohegan Ave., New London, Connecticut 06320-4196. Bulletin Number 37. Email: arbo@conncoll.edu)

The Connecticut River is the longest and largest river system in New England, originating in the mountains of northern New Hampshire, flowing southward more than 400 miles to discharge into Long Island Sound. Once referred to as "the best landscaped sewer in the nation, . . . it has come full circle to be a very high quality, fully functioning ecological system."

The focus of this booklet is on the southern reaches of the river. Find out here why it is so special, and why the Ramsar Convention rates the lower Connecticut a "Wetland of International Importance."

MANAGING LAKES AND RESERVOIRS, by NALMS and Terrene Institute. 2001. 382 pp.

(Published by North American Lake Management Society and the Terrene Institute. Order from NALMS, POB 5443, Madison, WI 53705. Email: nalms@nalms.org)

This is the third edition of a manual produced to provide guidance to citizens. In 9 chapters, this informative and easy-to-read book reviews ecological concepts, management planning, water quality, problem identification, watershed management, lake and reservoir management, and lake protection.

PLANT INVASIONS - Ecological threats and management solutions, edited by L. Child, J.H. Brock, G. Brundu, K. Prach, P. Pysek, P.M. Wade and M. Williamson. 2003. 457 pp.

(Published by Backhuys Publishers, POB 321, 2300 AH Leiden, The Netherlands. ISBN 90-5782-135-4. Euro 108.00 plus S/H. Email: backhuys@backhuys.com WWW: www.backhuys.com)

This contains 30 papers presented at the 6th EMAPi (Ecology and Management of Alien Plant Invasions) conference at Loughborough University, UK (September,

2001). "This volume explores ecological threats posed by alien plants through relevant case studies of species biology and ecology, mechanisms of invasion (including rates of spread), ecological impacts, the relationship between invasive species and their congeners, and offers management solutions through a variety of control and management techniques." Presentations include case studies and alien flora lists of Britain, Italy, Germany, the Czech Republic, Hungary, Poland, Wales, South Africa, New Zealand, Argentina, Australia... The Control section discusses a new "herbicidal gel" for controlling vines; the Species Ecology section includes papers on some of the US's least favorite invaders.

PLAYAS OF THE GREAT PLAINS, by L.M. Smith. 2003. 257 pp.

(Published by the University of Texas Press, POB 7819, Austin, TX 78713-7819. ISBN 0-292-70177-2. \$24.95 (paperback) plus S/H. To order, phone 800-252-3206.)

The shallow wetlands found in semi-arid to arid environments are called "playas." In the western great plains of North America, playas provide habitat to plants and animals, including migratory birds. They also serve as recharge areas. Needless to say, playas are threatened.

This book presents what is known about great plains prairie playas, their origin, development, flora, fauna, structure, function, diversity and human use since prehistoric times. The author also presents a blueprint for playa conservation.

ECOLOGIA E MANEJO DE MACROFITAS AQUATICAS, by S.M. Thomaz and L.M. Bini. 2003. 341 pp. (In Portuguese)

(Published by Universidade Estadual de Maringa, NPL-IA, Biblioteca Setorial, Avenida Colombo, 5790 - CEP-87020-900, Bloco G-90, Maringa - PR, Brasil. Email: biblioteca@nupelia.uem.br)

The ecology and management of aquatic plants of Brasil is the main topic of this book, a collection of 16 papers by the country's leading plant scientists. Topics include primary production, limiting fac-

tors, habitat predictability, decomposition, phytosociology, biological control, dynamics, bioindicators, zooplankton and invertebrates.

TROPICAL FLOWERING PLANTS - A Guide to Identification and Cultivation, by K.A. Llamas. 2003. 424 pp.

(Published by Timber Press, 122 SW Second AVE, Suite 450, Portland, OR 97204-3527. ISBN 0-88192-585-3. \$69.95 plus S/H. Email: mail@timberpress.com WWW: <http://www.timberpress.com>)

For scientists and gardeners alike, this large-format book is organized by botanical family, but includes no keys. It includes introductory writeups about families and genera, and short descriptions and more than 1,500 excellent (though smallish) color photos of 1,400 species of tropical and subtropical flowering trees, shrubs, vines and herbaceous plants of the world.

Included are appendices on invasive and potentially invasive species; threatened and endangered species; plants for coastal landscaping; and xerophytic (adapted to dry conditions) plants.

AQUATIC AND RIPARIAN WEEDS OF THE WEST, by J.M. DiTomaso and E.A. Healy. 2003. 442 pp.

(Published by the University of California, Publication #3421. ISBN 1-879906-59-7. \$40.00 plus S/H. Order through the California Weed Science Society: http://www.cwss.org/aquatic_book.htm)

This excellent book is the "first comprehensive identification manual for aquatic and riparian weeds west of the Rocky Mountains." Full descriptions and pictures of seeds, seedlings and mature plants, root structure, flowers and fruits of 89 species are included, and another 96 plants are pictured and compared as similar species. Other information includes synonyms, habitat, distribution, propagation and phenology, and similar species. Field and closeup pictures are plentiful, large, sharp and very well printed. Handy "identification tables" and keys are included.

A real bargain at \$40.

WETLANDS - NUTRIENTS, METALS AND MASS CYCLING, edited by J. Vymazal. 2003. 376 pp.

(Published by Backhuys Publishers, POB 321, 2300 AH Leiden, The Netherlands. ISBN 90-5782-140-0. Euro 106.00 plus S/H. Email: backhuys@backhuys.com WWW: <http://www.backhuys.com>)

This book consists of 21 papers from the workshop, "Nutrient Cycling and Retention in Natural and Constructed Wetlands IV" held at Trebon, Czech Republic in September, 2001. It is for scientists who are working on functioning constructed wetlands for wastewater treatment. The authors estimate there are 1,000 wastewater treatment wetlands systems in North America and a similar number in Europe. The subjects of these papers include nutrient removal by *Pistia stratiotes*; efficacy of wetlands for phosphorus removal in the Everglades; comparisons of various artificial wetlands; sludge drying reed beds; emission rates of gases; acid rain effects and other relevant topics.

GLOBAL SEAGRASS RESEARCH METHODS, edited by F.T. Short and R.G. Coles. 2001. 482 pp.

(Published by Elsevier Science, POB 211, 1000 AE Amsterdam, The Netherlands; or Elsevier, Customer Service Dept., 11830 Westline Industrial Drive, St. Louis, MO 63146. ISBN 0444508910. \$174.50 plus S/H. WWW: <http://www.elsevier.com>)

Seagrasses provide food for sea turtles, nearly 100 fish species, waterfowl, manatees and other animals. Their physical structures support breeding and nurseries for crustaceans, fish and molluscs, in addition to stabilizing sediments and filtering nutrients and contaminants.

This book for seagrass scientists and managers presents "globally applicable techniques for seagrass research," from basic plant collection to statistical approaches and plant-animal interactions.

Authors/Editors/Publishers:

Please send any books that may be of interest to our readers for review in AQUAPHYTE.

New Translation of Classic Book

The Biology of Aquatic Plants, translated from Heinrich Schenck's German *Biologie der Wassergewächse*, 1886, by Donald H. Les, Professor of Ecology and Evolutionary Biology at the University of Connecticut.

"... one of the most important general contributions ever made to the study of water plants..."

- Agnes Arber (1920) on Schenck's *Die Biologie der Wassergewächse*

Introduction

The German scientific literature of the 19th century comprises an extensive collection of original, meticulous, and accurate botanical information. As an American graduate student in the 1980's, I was warned lightheartedly, "Never get too excited about your findings because a German botanist had probably made the same discovery a hundred years ago." Several semesters of graduate school German gave me access to this literature and revealed the impressive amount of botanical data that remained virtually inaccessible to most English speaking scientists. Unfortunately, this problem is exacerbated by the preeminence of the English language in the contemporary scientific literature, which in English speaking countries has perhaps reduced the need for fluency in the classical languages.

Die Biologie der Wassergewächse is an essential reference for students in the field of aquatic plant biology because it presents an insightful review of major research conducted during the 19th century, a period of intensive botanical investigation. Today, with a shift in emphasis to molecular and other laboratory based scientific research, basic studies of aquatic plant natural history have waned and this area is still best represented in the older literature. *Die Biologie der Wassergewächse* contains invaluable knowledge on this topic.

Unfortunately, Schenck's work has become increasingly forsaken in subsequent English language books written on aquatic plants. In *Water plants*¹ (1920), the first comprehensive monograph of aquatic plants to be published in English, *Die Biologie der Wassergewächse* is cited more than 25 times. However, in *The Biology of Aquatic Vascular Plants*² (1967), the work is cited only nine times and in *Limnological Botany*³ (1975), it is not even mentioned.

The reduced citations are not simply due to obsolescence of subject matter, because much of the content remains accurate to this day. Moreover, Schenck's book provides an important historical perspective on the state of knowledge that existed in this branch of science during the 19th century. This book appeared in the aftermath of Darwin's *Origin of species* and presents some of the first characterizations of aquatic plant adaptations with evolutionary overtones.

¹Arber, A. 1920. *Water plants: a study of aquatic angiosperms*. Cambridge: University Press.

²Sculthorpe, C. D. 1967. *The biology of aquatic vascular plants*. London: Edward Arnold (Publishers) Ltd.

³Hutchinson, G. E. 1975. *A treatise on limnology*. Volume 3: *Limnological botany*. New York: John Wiley & Sons.

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Heinrich Schenck,
photog. 1889.



Hunt Institute for Botanical Documentation

A Research Division of Carnegie Mellon University,
Pittsburgh, Pennsylvania, <http://huntbot.andrew.cmu.edu>

“RACHEL MCMASTERS MILLER HUNT’S collecting interests brought together aspects of art, history, science and literature as they related to plants and gardens. Her private book collection was well known, and her scholarship led her also to collect related artworks, portraits and manuscripts significant in the history of botany. Her collecting efforts, as well as those of the early Hunt Botanical Library staff, focused on publications and manuscripts from 1730 to 1840, a period of intense intellectual ferment and productivity in botanical history.”⁽¹⁾

The Hunt Institute for Botanical Documentation specializes in the history of botany. Founded in 1961, the Institute is an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. It serves the international scientific community through research and documentation. The Institute maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other forms of information service. It serves the reference needs of biologists, historians, librarians, bibliographers and the interested public.

The Institute’s collections are curated by four departments: archives, art, bibliography, and the library. The current collections include approximately 28,000 books and botanical publications that date from the 1400s; 24,000 portraits and 30,000 watercolors, drawings and prints; manuscripts, with 2,000 items such as letters, journals and diaries, field notes, documents, drafts of published and unpublished books and articles, annotated maps, passports, and other personal papers of botanists.

Databases at the Hunt Institute include one of the world’s largest and most broadly representative collections of botanical art and illustration; the library, which is searchable via the Carnegie Mellon University Libraries’ online catalogues at <http://cameo.library.cmu.edu>; the Categorical Glossary for the Flora of North America Project; the Register of Original Botanical Art; the Portrait Collection; and databases pertaining to Linnaean dissertations. The Institute is in the process of formatting existing databases for the Web.

⁽¹⁾ Hunt Institute for Botanical Documentation web site at <http://huntbot.andrew.cmu.edu>



From John Fisk Allen’s *Victoria regia*, 1854. Courtesy of Hunt Institute.

AGORA - Online access to research for low-income countries

AGORA, or Access to Global Online Research in Agriculture, is an initiative launched in October 2003 to provide free or low-cost online access to major scientific journals in agriculture and related biological, environmental and social sciences to public institutions in developing countries. Access to over 400 journals from leading academic publishers will be provided via **AGORA**. Led by the Food and Agriculture Organization (FAO) of the United Nations, the goal of **AGORA** is to increase the quality and effectiveness of agricultural research, education and training in low-income countries, with the long range goal of improving food security.

Founding publishers of **AGORA** are Blackwell, CABI, Elsevier, Kluwer Academic, Lippincott, Williams & Wilkins, Nature Publishing Group, Oxford University Press, Springer-Verlag, and John Wiley & Sons. Of the 400 plus journals being offered, the following are included: *American Journal of Botany*, *Annals of Botany*, *Annual Review of Plant Biology*, *Aquaculture*, *Aquatic Botany*, *Aquatic Ecology*, *Biological Control*, *Biological Invasions*, *Botanical Journal of the Linnean Society*, *Conservation Biology*, *Ecological Modelling*, *Environmental and Experimental Botany*,

Freshwater Biology, *Hydrobiologia*, *International Review of Hydrobiology*, *Journal of Ecology*, *Journal of Experimental Botany*, *Nature*, *New Phytologist*, *Oecologia*, *Plant Pathology*, *Remote Sensing of Environment*, *Science of the Total Environment*, *Weed Research*, and *Wetlands Ecology and Management*.

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<http://www.aginternetwork.org/en/about.php>

Look at the Web Sites, Complete the Crossword, Win a Prize!

The first 10 people (any state, any country) who return the correctly-completed crossword puzzle will win TWO sets of the four laminated plant-photomurals (<http://plants.ifas.ufl.edu/mural.html>) and an aquatic plant ID deck. This puzzle can be solved by referring to two web sites:

our original web site: <http://plants.ifas.ufl.edu> and our brand new one: <http://plants.ifas.ufl.edu/guide>

Read the clue, refer to the URL cited, find the answer, and fill it in. Photocopy your completed crossword puzzle at 100% and send it via snailmail to: CROSSWORD, Center for Aquatic and Invasive Plants, 7922 NW 71st Street, Gainesville, FL 32653 - USA.

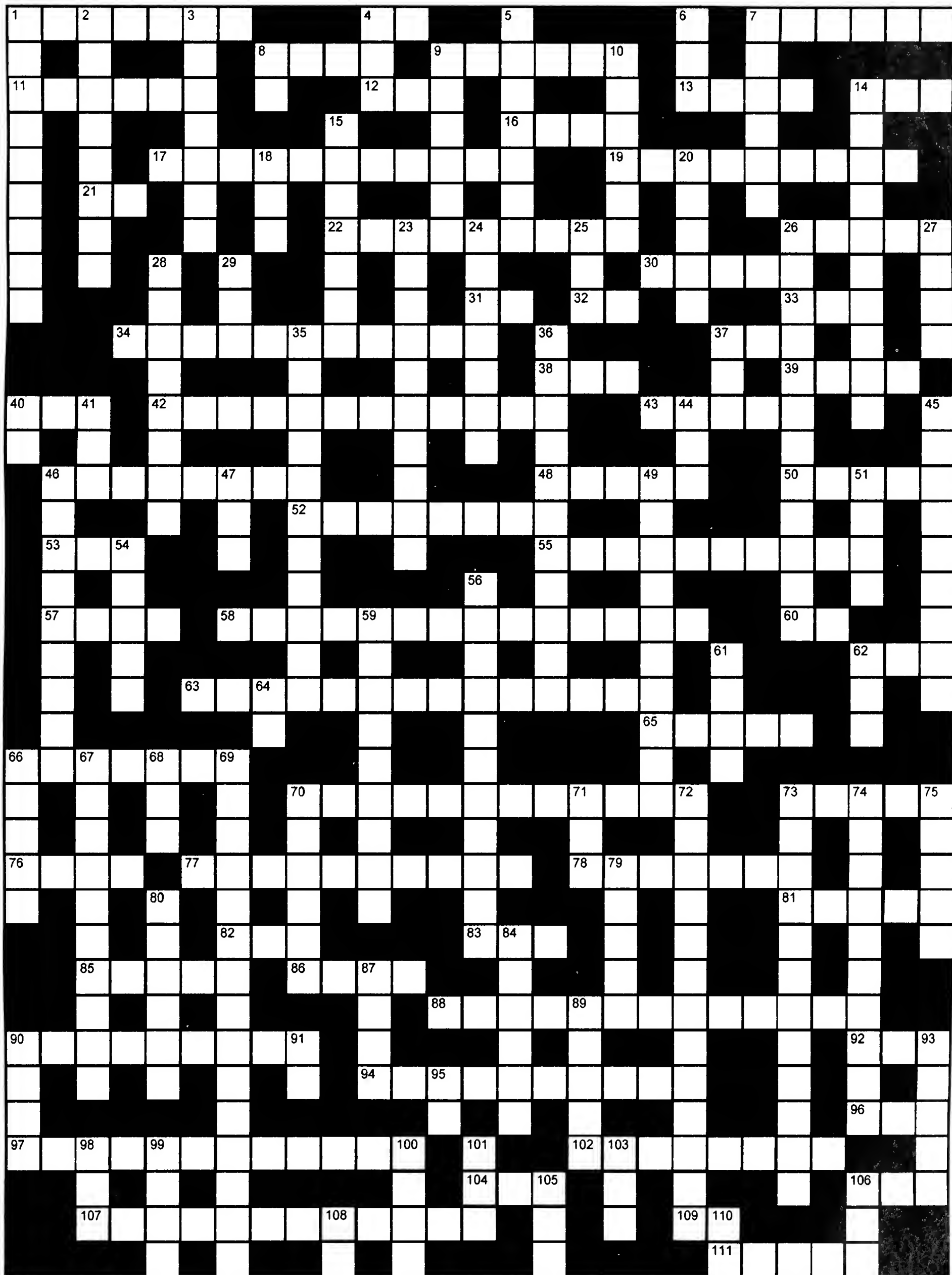
Across

1. The Sunshine state
4. Weight, abb.
7. Used aquatic herbicide containers must be triple _____.
8. Harvested plants left in a _____
11. Plants produce it for fish too
12. 2,000 lbs
13. Not hard water, but _____
14. A quagmire ([...edu/gloss-b.html](http://plants.ifas.ufl.edu/gloss-b.html))
16. A kind of map
17. Famous Strand of orchids ([...edu/gallery2.html](http://plants.ifas.ufl.edu/gallery2.html))
19. *Vallisneria americana* ([...edu/allplants.html](http://plants.ifas.ufl.edu/allplants.html))
21. A measure of weight
22. _____ flushing rate ([...edu/guide/hyflrt.html](http://plants.ifas.ufl.edu/guide/hyflrt.html))
26. Keeping the plant in its place
30. Bi-manual-powered craft
31. A DEP Regional Biologist (abb.)
32. Thousandth of a liter
33. _____-grass ([...edu/cljapic.html](http://plants.ifas.ufl.edu/cljapic.html))
34. _____ *americana* ([...edu/vaampic.html](http://plants.ifas.ufl.edu/vaampic.html))
37. At the end of a nozzle
38. Describes what's legal and what's not
39. Singular of number 26 Across
40. Lots of applicators in one place
42. Genus of beakrushes ([...edu/rhynch.html](http://plants.ifas.ufl.edu/rhynch.html))
43. Famous bacteria ([...edu/guide/bacteria.html](http://plants.ifas.ufl.edu/guide/bacteria.html))
46. First author listed, From the Database, AQUAPHYTE, summer 2003 ([...edu/auaph.html](http://plants.ifas.ufl.edu/auaph.html))
48. Tiny droplets going where you don't want them
50. One of these: [...edu/wthhydtub1.jpg](http://plants.ifas.ufl.edu/wthhydtub1.jpg)
52. Leaves may be alternate, whorled, or _____
53. Not bottom, but _____
55. "Use rototiller-like blades to churn..." ([...edu/guide/mechcons.html](http://plants.ifas.ufl.edu/guide/mechcons.html))
57. _____ of speed, _____ of application, _____ of flow
58. The most enriched state ([...edu/guide/trophstate.html](http://plants.ifas.ufl.edu/guide/trophstate.html))
60. The _____ Johns River flows north in Florida.
62. The center of the hurricane
63. A National Wildlife Refuge ([...edu/chassa.html](http://plants.ifas.ufl.edu/chassa.html))
65. Southern _____ ([...edu/nagupic.html](http://plants.ifas.ufl.edu/nagupic.html))
66. The sixth picture of "Some Florida Springs" ([...edu/guide/springs.html](http://plants.ifas.ufl.edu/guide/springs.html))
70. *Panicum repens* ([...edu/panrep.html](http://plants.ifas.ufl.edu/panrep.html))
73. The least enriched is _____ trophic ([...edu/guide/trophstate.html](http://plants.ifas.ufl.edu/guide/trophstate.html))
76. Multiples of 2,000 lbs
77. Principles of knowledge and conduct ([...edu/guide/whymanag.html](http://plants.ifas.ufl.edu/guide/whymanag.html))
78. A vine's little helper ([...edu/gloss-tu.html](http://plants.ifas.ufl.edu/gloss-tu.html))
81. Extension worker (<http://plants.ifas.ufl.edu/extension/ces.html>)
82. A pair
83. A member of a pod
85. *Hygrophila polysperma*'s nickname
86. A plant where we don't want it

88. Alligator weed, _____ *philoxeroides* ([...edu/alphpic.html](http://plants.ifas.ufl.edu/alphpic.html))
90. The third category of threats listed on this page, [...edu/guide/humimpac.html](http://plants.ifas.ufl.edu/guide/humimpac.html)
92. Humic acids can make the water _____-colored ([...edu/guide/humacd.html](http://plants.ifas.ufl.edu/guide/humacd.html))
94. Star-rush is a _____ species ([...edu/dichpic.html](http://plants.ifas.ufl.edu/dichpic.html))
96. The BIPM is part of the _____
97. This Florida river has rapids! ([...edu/hillsbor.html](http://plants.ifas.ufl.edu/hillsbor.html))
102. This page is about herbicide testing and _____: [...edu/guide/sup7herb.html](http://plants.ifas.ufl.edu/guide/sup7herb.html)
104. _____ root really does have _____ roots! ([...edu/idthis.html](http://plants.ifas.ufl.edu/idthis.html))
106. To put into service
107. Amount of production over a given period of time ([...edu/glossin9.html](http://plants.ifas.ufl.edu/glossin9.html))
109. Sodium, on the periodic chart
111. The oldest _____ in the Western Hemisphere is at Ortona, Florida ([...edu/guide/canals.html](http://plants.ifas.ufl.edu/guide/canals.html))

Down

1. "Floating plants" is the plant type category at [...edu/_____](http://plants.ifas.ufl.edu/_____).html
2. _____ *filiformis* drawing at [...edu/oxyfil2.jpg](http://plants.ifas.ufl.edu/oxyfil2.jpg)
3. Leaves with large saw-like teeth ([...edu/gloss-de.html](http://plants.ifas.ufl.edu/gloss-de.html))
4. Not dry
5. We're on a tectonic platform called the "Florida _____" ([...edu/guide/geology.html](http://plants.ifas.ufl.edu/guide/geology.html))
6. 4.410 kg equals two _____ ([...edu/o-conver.html](http://plants.ifas.ufl.edu/o-conver.html))
7. St. Marks is a _____ ([...edu/marks.html](http://plants.ifas.ufl.edu/marks.html))
8. Point of View abb.
9. The anther to this question
10. Not from around here
14. 9th choice under "B", [...edu/photocom.html](http://plants.ifas.ufl.edu/photocom.html)
15. Another common name for wild taro ([...edu/coespic.html](http://plants.ifas.ufl.edu/coespic.html))
18. _____ boat, a necessity for APM in Florida
20. Part of the corolla ([...edu/gloss-p.html](http://plants.ifas.ufl.edu/gloss-p.html))
23. Lake Okeechobee is a _____ lake ([...edu/guide/lakes.html](http://plants.ifas.ufl.edu/guide/lakes.html))
24. Aeration is provided by an _____ ([...edu/guide/physcons.html](http://plants.ifas.ufl.edu/guide/physcons.html))
25. [...edu/guide/ipmanage.html](http://plants.ifas.ufl.edu/guide/ipmanage.html) is about _____
26. [...edu/guide/sup5herb.html](http://plants.ifas.ufl.edu/guide/sup5herb.html) is about use _____
27. Not a freshwater marsh, but a _____ marsh
28. Smooth, without hairs ([...edu/gloss-fg.html](http://plants.ifas.ufl.edu/gloss-fg.html))
29. Obligate abb. (A plant that requires water)
35. American cupscale grass, _____ *striata* ([...edu/graplants.html](http://plants.ifas.ufl.edu/graplants.html))
36. Submersed *Utricularia* eats animals ([...edu/photocom.html](http://plants.ifas.ufl.edu/photocom.html))
37. _____logy, _____diversity, _____tic, _____chemistry
40. Eighth most abundant natural element ([...edu/guide/magnes.html](http://plants.ifas.ufl.edu/guide/magnes.html))
41. Insect's nickname ([...edu/guide/biocons.html](http://plants.ifas.ufl.edu/guide/biocons.html))
44. What a harvester does ([...edu/guide/mechcons.html](http://plants.ifas.ufl.edu/guide/mechcons.html))
45. Where aquatic plants are grown for sale
46. Not opposite or whorled leaves, but _____
47. Not even, but _____
49. Florida's native rare pondweed, *Potamogeton* _____ ([...edu/photos.html](http://plants.ifas.ufl.edu/photos.html))
51. In the job, the one above
54. Same as 20 down
56. [...edu/guide/invplant.html#invsteward](http://plants.ifas.ufl.edu/guide/invplant.html#invsteward) - what this is about
59. *Eleocharis baldwinii* common name ([...edu/photos.html](http://plants.ifas.ufl.edu/photos.html))
61. Replenishes our lakes and rivers
62. To flow away
64. Arsenic in the periodic chart
66. Bunches of small feathers or hairs
67. The 14th picture on [...edu/subplants.html](http://plants.ifas.ufl.edu/subplants.html)
68. What world does it come from: [...edu/lygod.html](http://plants.ifas.ufl.edu/lygod.html)
69. Fall panic grass, *Panicum* _____ ([...edu/allplants.html](http://plants.ifas.ufl.edu/allplants.html))
70. *Sapium sebiferum* is Chinese _____ ([...edu/photos.html](http://plants.ifas.ufl.edu/photos.html))
71. Large Florida snake likes river swamps ([...edu/guide/snakes.html](http://plants.ifas.ufl.edu/guide/snakes.html))
72. Dead plants fall to the bottom in the process of _____
73. Shaped like a lance point reversed ([...edu/gloss-no.html](http://plants.ifas.ufl.edu/gloss-no.html))
74. When several management methods are used at once, they are (or ought to be) _____ ([...edu/guide/ipmanage.html](http://plants.ifas.ufl.edu/guide/ipmanage.html))
75. Egg-shaped ([...edu/gloss-no.html](http://plants.ifas.ufl.edu/gloss-no.html))
79. "There's no hydrilla because the grass carp have _____ it."
80. Hydrilla tuber weevil, _____ *affinis* ([...edu/guide/biocons.html](http://plants.ifas.ufl.edu/guide/biocons.html))
84. Having a smooth leaf margin ([...edu/gloss-de.html](http://plants.ifas.ufl.edu/gloss-de.html))
87. *Sisyrinchium* is blue-_____ ([...edu/sisang.html](http://plants.ifas.ufl.edu/sisang.html))
89. Member of a clone ([...edu/gloss-qr.html](http://plants.ifas.ufl.edu/gloss-qr.html))
90. Soft, spongy center of the stem ([...edu/gloss-p.html](http://plants.ifas.ufl.edu/gloss-p.html))
91. Scientific abb. for nickel
93. Tropical soda _____ ([...edu/allplants.html](http://plants.ifas.ufl.edu/allplants.html))
95. Scientific abb. for copper
98. A petal might have one ([...edu/gloss-km.html#123](http://plants.ifas.ufl.edu/gloss-km.html#123))
99. Where the equipment is repaired
100. Might be found at the ligule
101. Not wet
103. Invert ingredient
105. 24 hours
106. A web address
108. Not out
110. You wish you had on an airboat



FROM THE DATABASE

Here is a sampling of the research articles, books and reports which have been entered into the aquatic, wetland and invasive plant database since Summer 2003.

The database contains more than 61,000 citations. To use the free APIRS database online, go to <http://plants.ifas.ufl.edu/> and click on APIRS Online Database.

To obtain articles, contact your nearest state or university library, or a

Armstrong, N., Planas, D., Prepas, E.
Potential for estimating macrophyte surface area from biomass.
AQUAT. BOT. 75(2):173-179 2003

Arora, A., Singh, P. K.
Comparisons of biomass productivity and nitrogen fixing potential of *Azolla* spp.
BIOMASS AND BIOENERGY 24(3):175-178 2003

Azim, M.E., Wahab, M.A.
Development of a duckweed-fed carp polyculture system in Bangladesh.
AQUACULTURE 218(1-4):425-438 2003

Balestri, E., Cinelli, F.
Sexual reproductive success in *Posidonia oceanica*.
AQUAT. BOT. 75(1):21-32 2003

Baret, S., Nicolini, E., Le Bourgeois, T., Strasberg, D.
Developmental patterns of the invasive bramble (*Rubus alceifolius* Poiret, Rosaceae) in Reunion Island: an architectural and morphometric analysis.
ANN. BOT. 91(1):39-48 2003

Bell, C.E.
Invasive plants of horticultural origin.
HORTSCIENCE 38:14-16 2003

Bennett, A.C.
Alligator weed (*Alternanthera philoxeroides*) control in Florida sugarcane.
IN: WSSA ABSTRACTS, MEETING OF THE WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P. 7 (ABSTRACT) 2003

Boutin, C., Jobin, B., Belanger, L.
Importance of riparian habitats to flora conservation in farming landscapes of southern Quebec, Canada.
AGRIC., ECOSYSTEMS, AND ENVIRON. 94(1):73-87 2003

Brewin, L. E., Mehra, A., Lynch, P.T., Farago, M.E.
Mechanisms of copper tolerance by *Armeria maritima* in Dolfrwynog Bog, North Wales - initial studies.
ENVIRON. GEOCHEM. AND HEALTH 25(1):147-156 2003

Brown, R. L., Peet, R. K.
Diversity and invasibility of southern Appalachian plant communities.
ECOLOGY 84(1):32-39 2003

Burundukova, O.L., Zhuravlev, Y.N., Solopov, N.V., P'yankov, V.I.
A method for calculating the volume and surface area in rice mesophyll cells.
RUSSIAN J. PLANT PHYSIOL. 50(1):133-139 2003

Campbell, D., Rochefort, L., Lavoie, C.
Determining the immigration potential of plants colonizing disturbed environments: the case of milled peatlands in Quebec.
J. APPL. ECOL. 40(1):78-91 2003

Campbell, M.H., Nicol, H.I.
Germination, emergence, growth, ecotypes and control of *Carex appressa* R. br. (Tussock sedge).
AUSTR. J. EXPER. AGRI. 42(1):27-36 2002

Center, T.D., Hill, M.P.
Field efficacy and predicted host range of the pickerelweed borer, *Bellura densa*, a potential biological control agent of water hyacinth.
BIOCONTROL 47(2):231-243 2002

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Use of a multiple-pathogen bioherbicide system for integrated management of torpedograss.
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Chandrasena, N., Pinto, L., Sim, R.
Reclaiming Botany Wetlands, Sydney through integrated management of *Ludwigia peruviana* and other weeds.
IN: PAPERS AND PROC., 13TH AUSTRALIAN WEEDS CONF., EDS. H. SPAFFORD JACOB, J. DODD, ET AL, SEPT. 8-13, PERTH, WESTERN AUSTRALIA, PLANT PROT. SOC. WESTERN AUSTRALIA, PP. 134-137 2002

Chornesky, E.A., Randall, J.M.
The threat of invasive alien species to biological diversity: setting a future course.
ANN. MISSOURI BOT. GARD. 90(1):67-76 2003

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PLANT, CELL AND ENVIRON. 26:17-36 2003

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Promoting low-canopy macrophytes to compromise conservation and recreational navigation in a shallow lake.
AQUAT. ECOL. 36:483-492 2002

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Torpedograss, *Panicum repens* L. (Poaceae): prognosis for classical biological control in the southeastern United States.
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Treatment and utilization of septic tank effluent using vertical-flow constructed wetlands and vegetable hydroponics.
J. ENVIRON. SCI. 15(1):75-82 2003

Davies, J., Honegger, J.I., Tencalla, F.G., Meregalli, G., et al
Herbicide risk assessment for non-target aquatic plants: sulfosulfuron - a case study.
PEST MANAG SCI 59(2):231-237 2003

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Economic impact of biological control of water hyacinth in southern Benin.
ECOL. ECONOMICS 45:105-117 2003

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Macrophyte harvesting management in Lake Geneva (Switzerland).

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Niche segregation and habitat specialisation of harpacticoid copepods in a tropical seagrass bed.

MAR. BIOL. 142(2):345-355 2003

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Physiological response of yellow nutsedge to systemic and contact herbicides.

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Eckert, C.G., Lui, K., Bronson, K., Corradini, P., et al

Population genetic consequences of extreme variation in sexual and clonal reproduction in an aquatic plant.

MOL. ECOL. 12(2):331-344 2003

Estime, L., O'Shea, M., Borst, M., Gerrity, J., et al

Effect of phosphorus concentration on the growth of cattail callus cells.

J. PLANT NUTRITION 26(3):691-707 2003

Filizadeh, Y., Murphy, K.J.

Response of sago pondweed to combinations of low doses of diquat, cutting, and shade.

J. AQUATIC PLANT MANAGE. 40:72-76 2002

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Surface micromorphology of torpedograss (*Panicum repens*), and three native, emerged aquatic plants in relation to application of glyphosate.

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Creation of a prioritization model to identify weeds of global significance.

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Molecular systematics and the control of invasive plants: a case study of *Tamarix* (Tamaricaceae).

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Species inventory and the local uses of the plants and fishes of the Lower Sondu Miriu wetland of Lake Victoria, Kenya.

HYDROBIOLOGIA 458:99-106 2001

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Floating islands in India: control or conserve?

INTERNAT'L. J. ECOL. ENVIRON. SCI. 29:157-169 2003

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Inbreeding depression influences genet size distribution in a marine angiosperm.

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Eelgrass *Zostera marina* loss in temperate estuaries: relationship to land-derived nitrogen loads and effect of light limitation imposed by algae.

MAR. ECOL. PROG. SER. 247:59-73 2003

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Efficiency of a weed cutting boat for controlling *Typha australis* in the River Senegal: re-growth potential in relation to timing and cutting depth.

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Laboratory host range testing of the flea beetle, *Pseudolampsis guttata* (Leconte) (Coleoptera: Chrysomelidae), a potential natural enemy for red water fern, *Azolla filiculoides* Lamarck (Pteridophyta: Azollaceae) in South Africa.

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Seasonality and depth zonation of intertidal *Halophila ovalis* and *Zostera japonica* in Ha Long Bay (Northern Vietnam).

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Physiological and molecular basis of susceptibility and tolerance of rice plants to complete submergence.

ANN. BOT. 91:227-241 2003

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The occurrence of apical septum in the ovary of *Rhyncholacis*, *Apinagia*, *Marthrum* and *Mourera* (Podostemoideae - Podostemaceae): taxonomic implications.

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Water quality impacts of mechanical shredding of aquatic macrophytes.

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Alien plant invasions: the story of cogon-grass in southeastern forests.

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The effect of alkalinity on photosynthesis-light curves and inorganic carbon extraction capacity of freshwater macrophytes.

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Effects of water level, shade and time on germination and growth of freshwater marsh plants along a simulated successional gradient.

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Phosphorus retention and movement across an ombrotrophic-minerotrophic peatland gradient.

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Biology and conservation status of smoothbark St. John's-wort.

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Effects of endothall in irrigation water on selected turf and ornamental species.

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Distribution of epiphytic bacteria on the surface of selected species of helophytes and nymphs from the littoral zone of the southern part of Jeziorak Lake in Poland.

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Alien plant threatens Nile crocodile (*Crocodylus niloticus*) breeding in Lake St. Lucia, South Africa.

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N deposition affects N availability in interstitial water, growth of sphagnum and invasion of vascular plants in bog vegetation.

NEW PHYTOL. 157(2):339-347 2003

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The United States naturalized flora: largely the product of deliberate introductions.

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nutrient stocks in an eutrophic macrophyte-dominated lake.

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Antagonism between bacteria and fungi on decomposing aquatic plant litter.

MICROB. ECOL. 45(2):173-182 2003

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RESTORATION ECOL. 11(1):56-61 2003

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Investigations into fluridone tolerance in selected hydrilla [*Hydrilla verticillata* (L.f.) Royle] populations.

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Runes, H.B., Jenkins, J.J., Moore, J.A., Bottomley, P.J., et al

Treatment of atrazine in nursery irrigation runoff by a constructed wetland.

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MEETINGS

WEED SCIENCE 2004 - WEED SCIENCE SOCIETY OF AMERICA (WSSA) ANNUAL MEETING.

February 9-12, 2004. Westin Crown Center, Kansas City, MO.

Includes an Invasive Plant Species Workshop, February 12-13, 2004.

Contact: <http://www.wssa.net>

13th ANNUAL SOUTHEASTERN LAKE MANAGEMENT CONFERENCE

presented by The North American Lake Management Society (NALMS).

March 7-9, 2004. Wild Dunes Resort, Isle of Palms, SC.

Hosted by the Lake and Watershed Association of South Carolina, the theme for this meeting is "Working Together - Sharing Resources." Conference, technical workshops and field trips to local projects.

Contact: Suzanne Thomas-Cole, LWASC, POBox 0176, FairPlay, SC 29643, Phone: 864-287-3297; FAX: 864-287-9641;

E-mail: suzycole@msn.com

65th ANNUAL MEETING OF THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS (ASB).

April 14-17, 2004. Memphis, TN.

Contact: WWW: <http://www.people.memphis.edu/~biology/asb/>

17th ANNUAL NATIONAL CONFERENCE ON ENHANCING THE STATES' LAKE MANAGEMENT PROGRAMS MONITORING LAKES AND RESERVOIRS.

April 20 - 23, 2004. Congress Plaza Hotel, Chicago, IL.

Cosponsored by the Chicago Botanic Garden, U.S. Environmental Protection Agency, and North American Lake Management Society.

Contact: Bob Kirschner, Chicago Botanic Garden, E-mail: bkirschn@chicagobotanic.org WWW: <http://www.nalms.org>

19TH ANNUAL FLEPPC AND 6TH ANNUAL SE-EPPC JOINT SYMPOSIUM.

April 28-30, 2004. Clarion Conference Center, Pensacola Beach, Florida.

"West of Eden" - Where research, policy and practice meet just steps away from the warm waters of the Gulf of Mexico.

Contact: WWW: <http://www.fleppc.org> or <http://www.se-eppc.org>

2004 AQUATIC WEED SHORT COURSE.

May 4-7, 2004. Fort Lauderdale, Florida.

Aquatic, Upland and Invasive Weed Control; Aquatic Plant Identification. A new concurrent session will focus on first time attendees with a morning of equipment calibration training and an afternoon of Aquatic and Natural Area weed control training.

Contact: Tyler J. Koschnick, Center for Aquatic and Invasive Plants, IFAS, University of Florida phone: (352) 392-5126 / FAX: (352) 392-3462 E-mail: tjoschnick@ifas.ufl.edu WWW: <http://conference.ifas.ufl.edu/aw/>

NUTRIENT MANAGEMENT IN AGRICULTURAL WATERSHEDS - A WETLANDS SOLUTION.

May 24-26, 2004. Teagasc Research Centre, County Wexford, Ireland.

Co-hosted by the UF/IFAS Soil and Water Science Department and the Teagasc Research Centre in County Wexford, Ireland. Designed to bring together leading international scientists, managers, regulators and engineers to critically summarize and evaluate state-of-the-art research on wetlands for water quality improvement, with special emphasis on agricultural catchments. Space limited to 150 attendees.

Contact: Sharon Borneman, 352/392-5930 E-mail: spborneman@ifas.ufl.edu WWW: <http://conference.ifas.ufl.edu/nutrient/>

SECOND LATIN-AMERICAN SHORT COURSE ON BIOLOGICAL CONTROL OF WEEDS.

June 7-10, 2004. Barcelo Hotel, Montelimar, Nicaragua.

Organized by the University of Florida in cooperation with the Universidad Nacional Agraria of Nicaragua. Short course will provide participants with a basic understanding of the principles and concepts of biological control of weeds using insects and pathogens. Participants will receive training in the procedures involved in the implementation of a weed biocontrol program. Group discussions will focus on the prospects for and limitations of biological weed control in the Latin-American region. Conference will be in Spanish.

Contact: Dr. Julio Medal, Course Coordinator, E-mail: medal@ifas.ufl.edu WWW: <http://biocontrol.ifas.ufl.edu/materials/nicaragua.htm>

15th ANNUAL MEETING, FLORIDA LAKE MANAGEMENT SOCIETY (FLMS).**June 7-10, 2004, Saddlebrook Resort, Tampa, FL.**

"A Tale of Many Waters: Florida's Limnic Resources" is the theme for this year's conference. The meeting site is a 480 acre natural Florida wetland and uplands site, with "walking villages" around the 82,000 square foot meeting facility. The conference will include a full day of workshops on June 7th.

Contact: Dr. Jim Griffin, Conference Chairman, E-mail: jim.griffin@swfwmd.state.fl.us or 800-423-1476 x4286

44th ANNUAL MEETING, AQUATIC PLANT MANAGEMENT SOCIETY (APMS).**July 11-14, 2004, Hyatt Regency, Tampa, FL.**

Contact: WWW: <http://www.apms.org/>

13th INTERNATIONAL CONFERENCE ON AQUATIC INVASIVE SPECIES.**September 19-23, 2004. Ennis, County Clare, Ireland.**

Contact: Elizabeth Muckle-Jeffs, E-mail: profedge@renc.igs.net WWW: <http://www.aquatic-invasive-species-conference.org/>

8th CONFERENCE OF THE INTERNATIONAL SOCIETY FOR PLANT ANAEROBIOSIS (ISPA).**September 20-24, 2004. Perth, Western Australia.**

The ISPA is composed of scientists interested in the mechanisms of acclimation and adaptation of plants to poorly aerated environments. Plants studied include those inhabiting marine, aquatic, salt marsh, and wetland environments; and terrestrial ecosystems subjected to seasonal episodes of waterlogging or submergence (including crop species and agricultural systems).

Contact: Tim Colmer, University of Western Australia, School of Plant Biology, 35 Stirling Highway, Crawley 6009 WA, Australia, E-mail: tdcolmer@cyllene.uwa.edu.au WWW: <http://www.ibba.cnr.it/ispa/>

31st NATURAL AREAS ASSOCIATION.**October 13-16, 2004. Holiday Inn Mart Plaza, Chicago, IL.**

Emerging issues: Possibilities & Perils is the theme of the 2004 meeting. Symposia and plenary sessions will focus on emerging problems and creative strategies to preserve biological resources for the future.

Contact: WWW: <http://www.naturalarea.org/>

24th INTERNATIONAL SYMPOSIUM - NALMS 2004 (NORTH AMERICAN LAKE MANAGEMENT SOCIETY)**November 3-5, 2004. Victoria, British Columbia, Canada.**

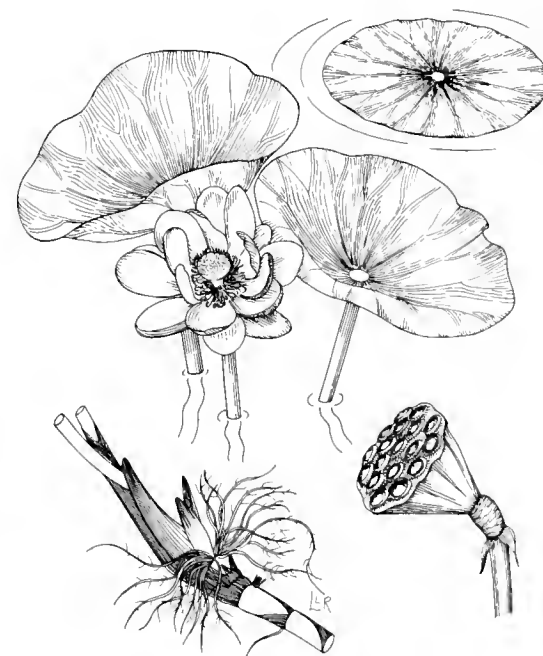
Contact: NALMS, PO Box 5443, Madison, WI 53705-0443, (608)233-2836; Fax: (608)233-3186. E-mail: nalms@nalms.org WWW: <http://www.nalms.org/>

Sanshui's Lotus World

Sanshui's Lotus World is the largest lotus ecological park in the world, which has exclusively integrated buildings, sculpture and lotus culture. The facility was founded by the Xinan town government of Sanshui under the guidance of professors Wang Qichao and Zhang Xingyan of the China Lotus Research Center. At present, there are over 300 varieties of lotus planted within, including "Space lotus" cultivated from air space and "Ancient lotus" cultivated from Liaoning province. Visitors can enjoy the park by bus or on foot, or canoe among the lotuses and pick flowers or roots. One can enjoy a lotus dinner of fresh lotus leaves, seeds and roots and take in the daily song and dance drama, "Lotus Fairy," which tells of an old but beautiful lotus fairy and a lotus root boy who loved each other and jointly fought against devils and sirens for their future happiness together. Lotus World has farmhouse-like villas as well as elegant and tranquil auditoriums to accommodate up to 400 people.

For more information, go to:

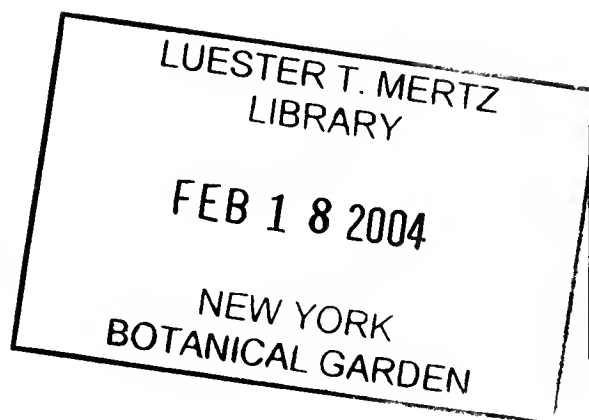
http://www.foshan.gov.cn/english/02_travelling/01_lyjd/02_lyjd_15_slw.htm



Nelumbo lutea
American lotus

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AQUAPHYTE

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Karen Brown

AQUAPHYTE is sent to managers, researchers and agencies in 71 countries around the world. Comments, announcements, news items and other information relevant to aquatic and invasive plant research are solicited.

Inclusion in **AQUAPHYTE** does not constitute endorsement, nor does exclusion represent criticism, of any item, organization, individual, or institution by the University of Florida.



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Regular features of each issue include **Books/Reports; Meetings;** and **From the Database**, which provides a sampling of new additions to the Aquatic, Wetland and Invasive Plant Information Retrieval System (**APIRS**) database. We also keep readers informed of other important developments in the world-wide field of aquatic and wetland plants, and invasive upland plants in Florida.

To continue your free subscription, please contact Karen Brown via e-mail at kpb@mail.ifas.ufl.edu or telephone, fax or write us using the information in the top left corner above.

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☐ Please make the following corrections to my address:

Florida law (FSS 283.55) requires that we purge our mailing list every other year.
We will be deleting individuals who do not respond by June 1, 2004.